

2018

State of Cape Town



Research Branch: Organisational
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City of Cape Town

2018

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Acronyms and Abbreviations

| | |
|--------------------|---|
| Apps | Applications |
| ART | Antiretroviral Treatment |
| BRT | Bus Rapid Transit |
| CBD | Central Business District |
| CCT | City of Cape Town (local government administration) |
| City | City of Cape Town (local government administration) |
| CoGTA | Department of Cooperative Governance and Traditional Affairs |
| CWRF | City Water Resilience Framework |
| DR TB | Drug-resistant Tuberculosis |
| GDP | Gross Domestic Product |
| GHG | Green House Gas |
| GVA | Gross Value Add |
| HIV/AIDS | Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome |
| ICT | Information and Communications Technology |
| IDP | Integrated Development Plan |
| IUDF | Integrated Urban Development Framework |
| Km | Kilometres |
| KWh/m ² | Kilowatts per hour per square metre |
| ℓ | Litres |
| MLD | Million litres per day |
| MSDF | Municipal Spatial Development Framework |
| OPP | Organisational Policy & Planning |
| PHC | Primary Healthcare |
| PM ¹⁰ | Particulate Matter 10 |
| RC | Resilient Cities |
| R&D | Research and Development |
| RIFD | Radio-frequency identification |
| SDG | Sustainable Development Goals |
| SoCT | State of Cape Town |
| Stats SA | Statistics South Africa |
| TB | Tuberculosis |
| TOD | Transit-oriented Development |
| µg/m | Micrograms per metre |
| UN | United Nations |
| WCG | Western Cape Government |
| WRP | Water Resilience Programme |

Disclaimer

This is a summary version of a full length report which is available upon request. All efforts and due care has been taken to ensure the accuracy in the assembly, analysis and compilation of data and information in this report. However, the City of Cape Town is unable to warrant the accuracy of the data and information, analysis and compilations contained in this report. Readers of this publication are deemed to have waived and renounced all rights to any claim against the City of Cape Town Council, its officers, servants or agents for any loss or damage of any nature whatsoever arising from any use or reliance upon such data, information, analysis or compilations.

Information is presented at the time of writing (June, 2018) with updates where possible. The overall approach to preparing this State of Cape Town report was to provide a focused and brief analysis and narrative in order to accommodate the new reading and information access patterns of presenting shorter information, supported by data and reflection. Accordingly, the information presented in the summary chapters are focused on key indicators and may not include all the theme related urban indicators and full analytical context.

In this report, the "City" refers to the City of Cape Town administration (organisation), including elected Councillors, responsible for the development and local administration of the city.

The "city" refers to the geographical area that is administered by the City of Cape Town, its physical elements, as well as all the people living in and active within the area.

For readers' convenience, source references are indicated in footnotes. A complete reference list is provided at the end of the report.

Acknowledgements

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Executive Summary

We are living in the *Urban Age* where the world is predominantly urban. Influenced by the effects of climate change and resource limitations –and in the context of an urban age – there is growing global, national and local emphasis on urban sustainability and urban resilience. The City of Cape Town (CCT) has emphasised the importance of sustainable development and resilience by including these as integral principles to guide its key strategic plan –the Integrated Development Plan (IDP) 2017-2022.

This State of Cape Town report has adopted the lenses of *resilience* and *sustainable development* to review and analyse key data and trends in Cape Town across four themes of economy, society, natural and built environment.

A high level overview of the key messages and key data trends emerging in each chapter is presented below.

Economy

Cape Town's experience over the last year indicates that economic growth cannot be pursued without due consideration of natural resource constraints. Water supply challenges in Cape Town and episodes of electricity load shedding oblige businesses and policymakers in the city to take account of the sustainability of growth plans. Similarly, the slant towards high-skill/high-tech industry in Cape Town's recent (and probable future) economic growth, means that, significant investments in human capital (whether by government, business or individuals) are essential for future proofing Cape Town's economy and ensuring that it remains as inclusive as possible.

Key Data Trends for Cape Town:

- GDP: R445 billion in 2017
- GDP per capita: R106 839 in 2017
- Exports: Increased from R49 billion in 2013 to R82 billion in 2017
- Sustainable economic growth: Economic growth between 2004-2017 was 3.2%, while electricity consumption growth was 0.3%
- High-skill/high-tech intensive industries: Increased from 39% of total GVA in 2001 to 44% in 2017

Society

The benefit of improving health and education levels and addressing the high levels of violence in Cape Town may be that residents will strengthen their capacity and know-how to manage personal and community trials, build personal resilience and contribute to collective ways to deal with adversity. The CCT seeks to facilitate the emergence of building more socially diverse and healthy communities in Cape Town. An important part of this will be to find ways to facilitate collaboration and partnerships within and across communities that will help build social resilience in the city.

Key Data Trends for Cape Town:

- Total population: Increased by 1.68% from 4 023 510 in 2015 to 4 174 510 in 2017
- Household size: Decreased from 3.32 in 2015 to 3.20 in 2017
- Average life expectancy: Increased from 61.1 years in 2012 to 64.0 years in 2017
- Households living in poverty: Decreased from 35.4% in 2012 to 28.2% in 2016
- Education: Those with higher than Grade 12 qualifications increased from 17.37% in 2011 to 20.72% in 2016

- Crime: All crime rates per 100 000 population decreased from 8 411 in 2007/8 to 7 930 in 2016/17

Natural Environment

To ensure that the natural environment remains accessible to future generations it is critical that the CCT continues maintaining and possibly extending its biodiversity network, as well as maintaining its open spaces, community parks, greenbelts and lakes. These would also strengthen the city's resilience against extreme weather events like heavy rainfall and drought by absorbing run-off from intense rainfall events and replenishing ground water stores. Alternative energy sources and continual implementation of energy efficiency measures are essential to enable a sustainable energy future. Water scarcity will become the "new normal". Cape Town will increase its resilience by diversifying its water supply systems (i.e. including desalination and groundwater), thus moving away from surface water dependence. Through strengthening the Circular Economy (via recycling and waste-to-energy initiatives) the City has managed to improve the reduction of waste to landfill and thereby reducing the need for requiring more scarce land for waste management purposes.

Key Data Trends for Cape Town:

- Biodiversity Networks (BioNet): Increased from 60.81% of BioNet conserved in 2014 to 64% in 2016
- Energy consumption of CCT buildings: Decreased from 72 KWh/m² in 2012 to 65 KWh/m² in 2017
- Daily water consumption: Decreased from 222.92 ℓ per day/capita in 2008 to 144 ℓ per day/capita in 2017
- Total waste diverted from landfill: Increased from 254 184 tons in 2010 to 496 910 tons in 2017

Built Environment

Implementation of the Metropolitan Spatial Development Framework (MSDF) will assist with Cape Town's built environment transitioning towards a more compact and therefore more resilient and sustainable urban form that better meets the needs of a rapidly changing urban population and economy. Challenges around informality remain given the high demand for housing and basic services. There is need for diverse modalities for delivering housing opportunities in the context of limited resources for delivering affordable public housing. The revised spatial development framework for Cape Town seeks to ensure that the urban poor are able to access better located housing, as well as to create better connectivity between the informal and the formal city. Further Cape Town has improved access to connectivity and the internet to support economic and social development, with a strong platform for future growth as a smart city.

Key Data Trends for Cape Town:

- Population density: 1700 people per km² in 2017
- Households living in informal dwellings (including backyarders): Increased from 16.8% in 2011 to 20% in 2016
- Private and/or company car use for travel to work: Increased from 38.08% of commuters in 2009 to 42.34% of commuters in 2016
- Walking to work: Increased from 6.62% in 2009 to 7.95% in 2016
- Travel time to work: Increase from 6.02% to 10.22% of commuters requiring 61 to 90 minutes travelling to work between 2009 and 2016
- Use of internet by households: Increased from 61.63% in 2011 to 76.13% in 2016

Introduction

This is the **Urban Age**. The world is now predominantly urban with over half the global population living in cities, and projected to increase to two-thirds by 2030¹. A similar trend can be observed for South Africa, the Western Cape and Cape Town.

Global urban population growth, current economic uncertainties, climate and environmental change, resource constraints and social ills all present challenges in ensuring that cities are places of opportunity, safety, caring and inclusivity. Consequently there is growing global, national and local emphasis on the need for urban sustainability and urban resilience².

In the global development and governance space, the United Nations (UN) in 2016 – as part of the Sustainable Development Goals (SDGs) – included a global development goal that is specific to cities. UN SDG Goal 11 seeks to promote an urban development agenda targeted at ensuring cities are inclusive, safe, resilient and sustainable. The New Urban Agenda is intended to support the implementation of SDG goal 11³.

The City of Cape Town (CCT) has included *Resilience* and *Sustainability* as integral to the guiding principles informing its Integrated Development Plan (IDP) 2017 – 2022. Further, the City as a member of the *100 Resilient Cities* (RC) network, is in the process of driving the development of a Resilience Strategy for Cape Town.

A number of definitions to resilience are available⁴. The definition which will guide the State of Cape Town 2018 analysis is that of 100RC. Resilience refers to the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stress and acute shocks they experience⁵.

Sustainable development is understood to refer to consuming urban development resources such as to meet the needs of present generations without compromising the ability of future generations to meet their needs⁶.

This *State of Cape Town 2018* report has applied the lenses of *resilience* and *sustainable development* to review and analyse key data and trends on Cape Town across the four themes of economy, society, natural and built environment.

A focus on resilience and sustainable development is further appropriate in that this report was compiled at a time when Cape Town was facing its longest and worst drought in recorded history. In many ways the drought itself demonstrates Cape Town's resilience and ability to adapt to extreme conditions.

The report is structured into four sections, reflecting four themes: Economy, Society, Natural Environment and Built Environment.

¹ United Nations, 2016a

² Harrison et al, 2014

³ United Nations, 2016b

⁴ Ibid; Romero-Lankao et al, 2016

⁵ <https://www.100resilientcities.org/cities/>

⁶ World Commission on Environment and Development, 1987

Economy

Overview

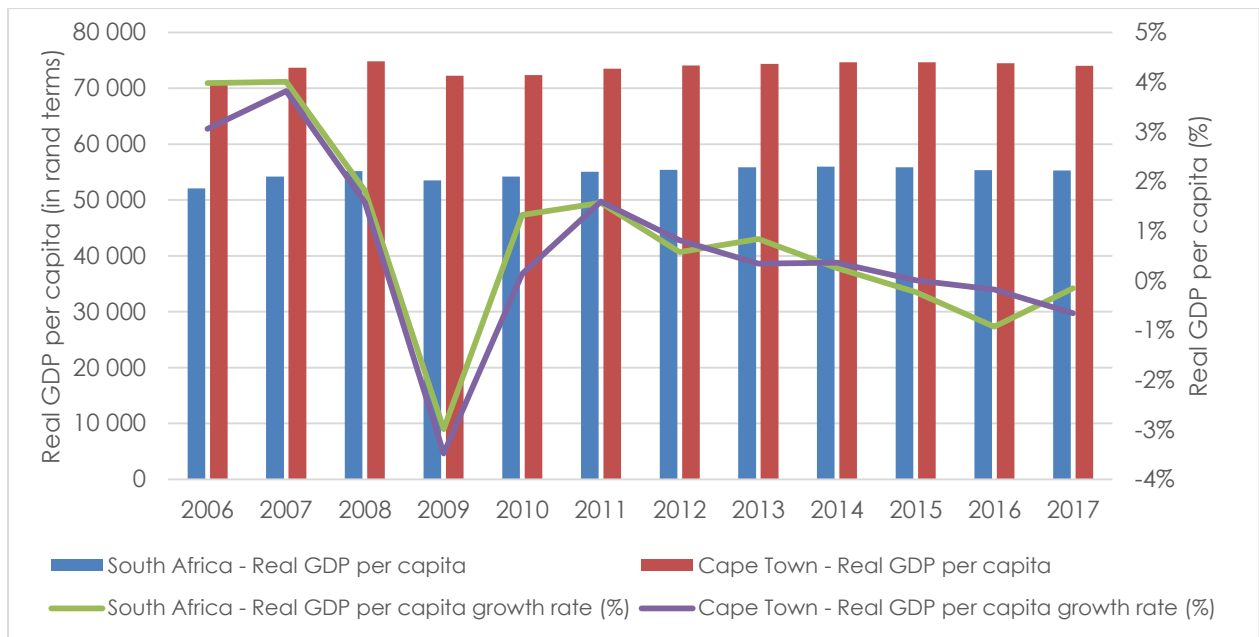
The success of cities, especially those in developing countries hinges on its economic growth and the economy's ability to distribute the benefits of economic growth to all its citizens. Cape Town is in a good position to leverage improved global prospects and renewed optimism in the South African economy, to stimulate economic growth in the city⁷. Renewed growth in emerging and advanced economies may see rising demand for Cape Town exports as well as the complimentary service offerings which support these exports.

Natural resource constraints (e.g. water supply) require businesses to adapt their production processes to adequately respond to increased levels of demand. Positively, local businesses have reported business reorientation to respond to supply constraints and changing domestic clientele demands as a result of water shortages. In the long-term Cape Town cannot afford to respond to crises only as they occur. With natural shocks becoming increasingly common and technological advancements accelerating, it becomes critical to embed resilience-thinking into all planning and policy making, including that related to the economy.

Key Economic Trends

Cape Town's Gross Domestic Product (GDP) in 2017 in current rand terms, stood at

Figure 1: Real GDP per capita trends – Cape Town and South Africa



Source: IHS Markit, 2018

R445 billion⁸. The city contributed 10% to national GDP that year and 70% to the output of the Western Cape⁹. GDP per capita in the city was R106 839 in 2017 (in

⁷ Quantec, 2018

⁸ IHS Markit, 2018

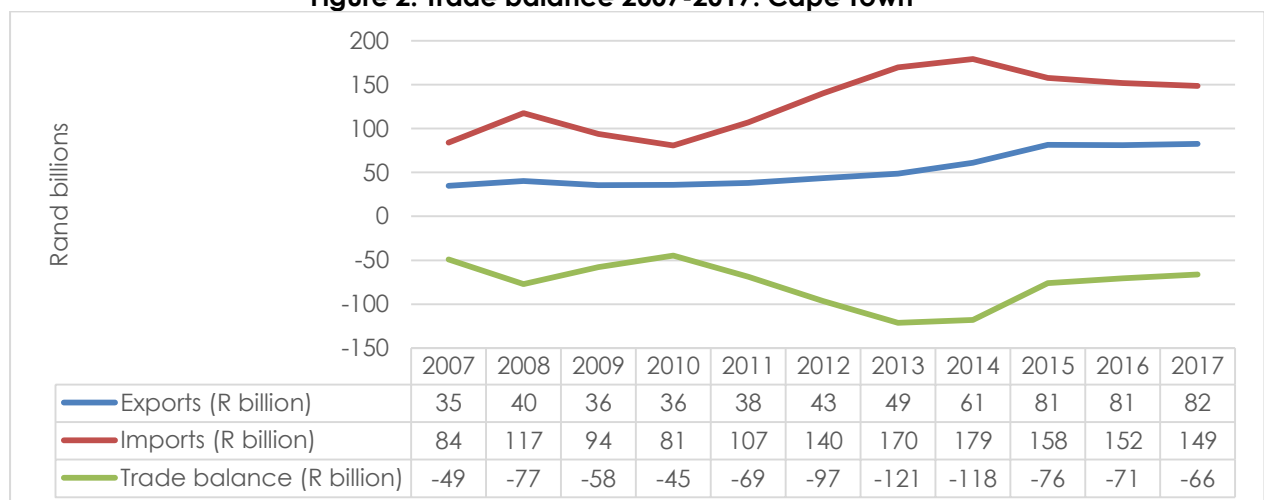
⁹ Ibid

current rand terms), marginally higher than GDP per capita of the Western Cape (R97 983) and notably more than national GDP per capita (R82 262)¹⁰.

Cape Town's Real GDP per capita growth was on par with that at the national scale suggesting that, while in absolute terms GDP per capita in the city is higher than the national average, it is still tied to the performance of the national economy (see Figure 1). While both Cape Town and South Africa's Real GDP per capita grew in the post-global financial crisis period (between 2009-2011), in recent years (between 2014-2017) both have seen a decline. With population growth rates over this period remaining relatively stable, real GDP per capita growth has largely mirrored the insipid performance of real GDP growth during this period.

In recent years Cape Town has seen a notable uptick in exports, increasing from R49 billion in 2013 to R82 billion in 2017, with an average year-on-year increase of 15% (see figure 2). When combined with a decrease of imports during this time, this has led to a substantial narrowing of the deficit on the trade balance, indicating the potential for the city's trade balance to recover to pre-financial crisis levels.

Figure 2: Trade balance 2007-2017: Cape Town



Source: Wesgro (using Quantec), 2018

Sustainable Growth

Economic growth is often pursued as an objective good but the nature of the relationship between economic growth and environmental degradation has been an issue of debate for many years¹¹. One theoretical hypothesis is that economic growth and resource consumption follows an inverted u-shaped relationship, implying that as an economy grows (and structurally advances from the primary to secondary sector) it initially uses more resources, thereby degrading the environment. However, it is hypothesised that a turning point is then reached, as the economy shifts towards a more services-oriented economy, correspondingly using less resources, thereby reducing environmental degradation. This hypothesis is referred to as the Environmental Kuznets Curve¹².

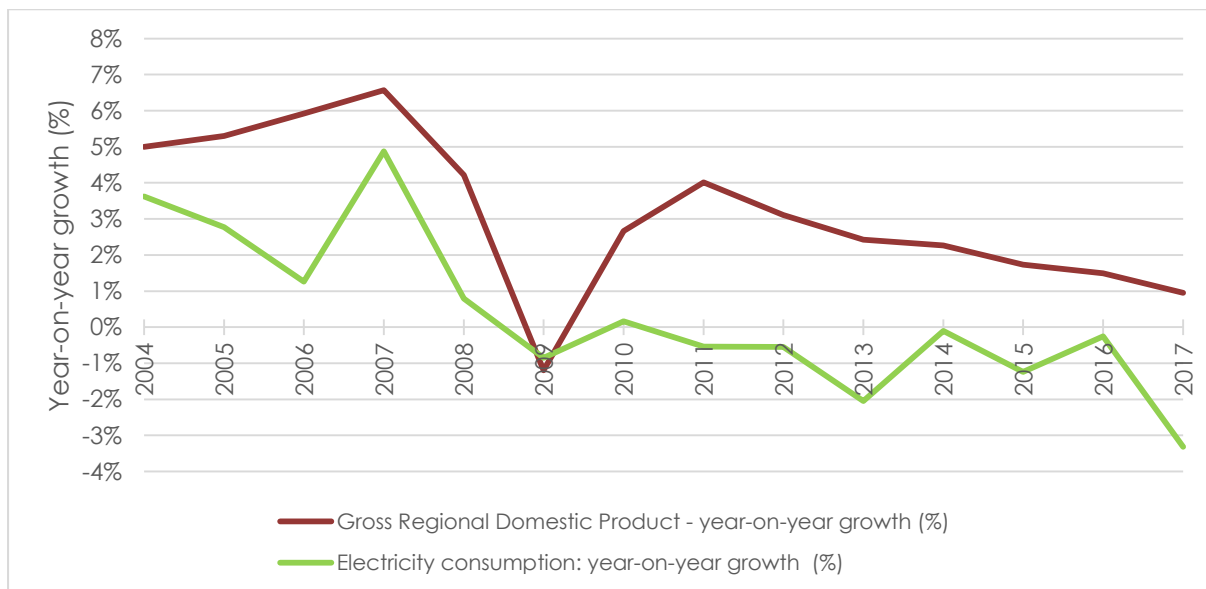
¹⁰ Ibid

¹¹ Nasr et al, 2014

¹² Inglesi-Lotz & Bohlmann, 2014

In Cape Town's context, where economic growth has averaged 1.8% in the last five years (2013-2017), the demand placed on urban resources could be expected to increase should such growth levels maintain or expand. However, in line with the Environmental Kuznet's Curve hypothesis, in recent years Cape Town has seen a decoupling of economic growth from electricity consumption, as shown in Figure 3. In particular, while average annual economic growth over the period of 2004-2017 was 3.2%, the average annual electricity consumption growth was 2.8 percentage points lower at 0.3%.

Figure 3: Year-on-year growth in electricity consumption and Gross Domestic Regional Product in Cape Town (%), 2004-2017¹³



Source: City of Cape Town, 2018a and own calculations using IHS Markit, 2018

A number of factors enabled the shift towards lower consumption in Cape Town including a rise in electricity tariffs, electricity demand-side management programmes implemented by the City, as well as endogenous¹⁴ changes¹⁵, such as the rise of the tertiary sector in the City. This signals a positive movement towards a less carbon-intensive metropolitan economy, however there are consequential effects which need to be managed¹⁶.

Comparing water consumption to economic growth in Cape Town (see Figure 4 below) does not immediately reveal a similar relationship. Water consumption increased in the initial period (between 2013-2015) by an average of 5%, possibly a function of population growth rather than economic growth which maintained growth of 2% over the depicted period. The reduction in average annual water consumption which occurred between 2015-2017 (-19%) could be attributed to the

¹³ Electricity consumption data displayed in this figure are only those represented by customers served by the City of Cape Town's electricity supply services. This thus excludes Eskom supplied customers. As the City distributes approximately two thirds of electricity in the metropolitan municipality's boundaries, however, this figure would seem representative of the general consumption trend across all customer groups (City of Cape Town, 2015: 61 and 83).

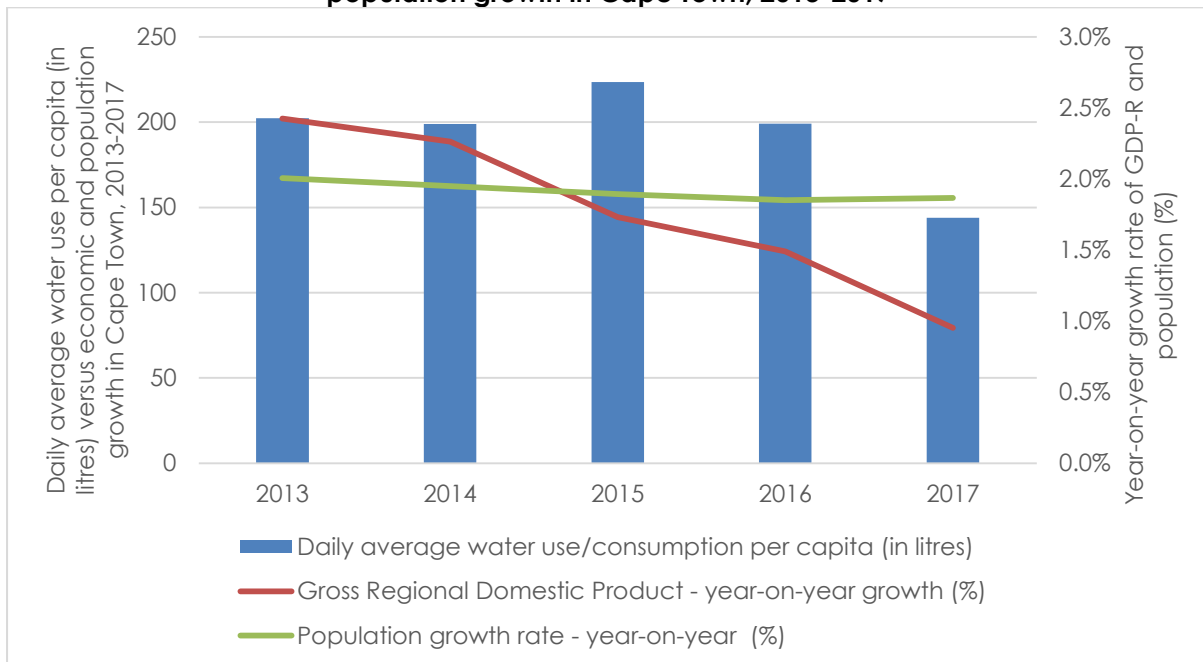
¹⁴ By endogenous it is implied that the change originated from within the city's economy, as opposed to being a function of external (exogenous) forces – so from outside the city's economy.

¹⁵ City of Cape Town, 2015

¹⁶ Ibid

marginal narrowing of population growth, however was more likely due to intensive demand-side management programmes to reduce water demand as dam levels in Cape Town and the Western Cape dropped to critical levels. The most notable decrease in water consumption (-28%), between 2016 and 2017, can be attributed to increased water restrictions and the City's 'Day Zero'¹⁷ messaging.

Figure 4: Daily average water use/consumption per capita (in litres) versus economic and population growth in Cape Town, 2013-2017



Source: City of Cape Town own calculations using City of Cape Town, 2018e, City of Cape Town, 2018f, Statistics South Africa, 2018a, and IHS Markit, 2018

While the impact which the restrictions have had on different users is still being determined, qualitative insights gathered by the City suggest that companies have shown notable levels of resilience in adapting to water shortages. Businesses which were affected by water restrictions on the supply-side (i.e. have directly had to reduce their water use in their production processes), have typically been more adaptable than those affected on the demand side – reorienting their production processes and/or finding alternative sources of water. In some cases, this has enabled a new range of greener (more water efficient) products to emerge. However, the negative economic impacts of the drought cannot be overlooked and in collaboration with the Western Cape Government, the City has been seeking means to minimise these.

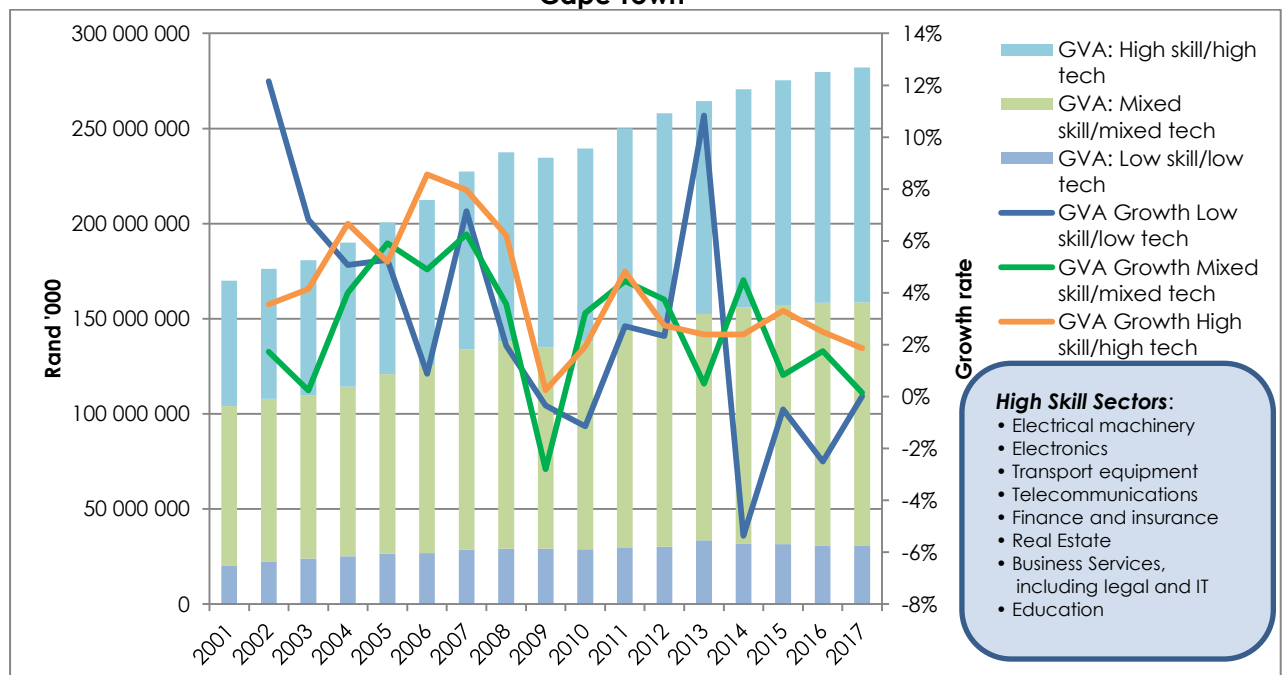
While economic growth presents Cape Town with the opportunity to increase income earning activities and create jobs, and through this overcome a range of socio-economic challenges, this growth, where possible, should be managed (through education and awareness raising programmes), to ensure sustainable resource-usage in the long-run. As the case of electricity consumption decoupling from economic growth, and the recent responses to the current drought show, through clear, continuous and accessible communication, it is possible to stimulate more environmentally friendly consumer behaviour.

¹⁷ Day Zero is the day that almost all of the taps in the city may be turned off and citizens may have to queue for water at approximately 200 sites across the peninsula. Each person would receive 25ℓ/day.

Sectoral shifts to high skill, high technology intensive sectors –future proofing the economy

Cape Town, like many mid-size emerging cities in the world, is experiencing sizeable changes in the composition of its economy, becoming increasingly reliant on the tertiary sector for economic growth while the primary and secondary economic sectors diminish in importance. These broad sectoral categorisations are, however, too limited an analytical lens to adequately capture the nature of a transition which is increasingly affected by fast-moving global trends in both technology advancements and consumer consciousness. The fourth 'industrial revolution'¹⁸ is altering the economic structure of many economies, including Cape Town's economy. Skill intensive sectors like Information and Communications Technology (ICT) and technology intensive sectors such as electronics are responsible for increasing shares of new value addition in many economies around the world. Similarly, moves toward a carbon free future, as highlighted in the previous section, have increased the importance of green technology, renewable manufacturing, and environmental services.

Figure 5: Gross value Added (GVA)¹⁹ and GVA growth by skill and technology intensity in Cape Town



Source: City of Cape Town own calculations using IHS Markit, 2018

Figure 5, in categorising²⁰ industries as high-skill/high tech, mixed skill/ mixed tech, or low skill/low tech for the period 2001-2017, indicates the degree to which Cape Town's economy is shifting to a high-skill, high-technology intensive growth path.

¹⁸ The World Economic Forum describes the Fourth Industrial Revolution as being "characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries" (World Economic Forum, 2016).

¹⁹ Where Gross Value Added (GVA) measures the combined contribution to Gross Domestic (Regional) Product (GDP-R) made by economic sectors in the economy. Mathematically, GVA equates to GDP-R plus subsidies on products, less taxes on products.

²⁰ These categories cut across the traditional sectoral categorisation of primary, secondary, and tertiary sectors, recognizing that within sectors certain industries are more or less skill or technology intensive.

High-skill/high-tech intensive industries have risen from constituting 39% of Cape Town's total GVA in 2001 to 44% in 2017. From a growth perspective, these industries have contributed 51.4% of the total growth in the economy between 2001 and 2017. Their contribution is even more pronounced between 2015 and 2017, where they contributed 79% of total economic growth and recorded an average growth rate of 2.6% - far in excess of the -1.0% and 0.9% for the mixed and low-skill industries. These findings are indicative of Cape Town's increasing reliance on skill intensive industries for economic growth. The growth rate is also indicative of the resilience of high skill, high tech industries in times of economic slowdown. The World Bank's²¹ latest report on innovation in South Africa highlights the resilience of South Africa's high-tech manufacturing sector "at a time when lower-tech manufacturing sectors are shedding jobs" and further suggests that "greater Research and Development (R&D) efforts are actually likely to create more jobs rather than shed jobs in net terms".

Notwithstanding the resilience of high-tech industries in South Africa and Cape Town, their comparatively low and declining²² growth rates compared internationally, means that in order for Cape Town businesses to keep up with global trends, they need to increasingly invest in R&D and in human capital development. A recent study found that the skills most demanded by Cape Town's growing industries were disproportionately IT-related, including the ability to use Perl, Python or Ruby, Java development, social media market analysis and data engineering among others²³. The current mismatch between the skills increasingly required by high growth industries in Cape Town and the existing skill profiles of new labour entrants and how this challenge may be addressed needs to be the preeminent consideration for economic policy makers and business leaders in the medium term to long-term as they look to shape a more resilient Cape Town economy.

Economic inclusion through the labour market

Fundamental to building a city that is economically inclusive is the efficient functioning of the labour market, as this is the main conduit through which income flows for the vast majority of a population. Cape Town's labour market is impacted by many of the same constraints which the national labour market faces, including high levels of unemployment and a skills mismatch between labour demand and labour supply. Cape Town however, in a number of respects, outperforms its metropolitan peers in South Africa. Cape Town has consistently had the lowest broad unemployment rate²⁴ of all the metros in South Africa. It also enjoys relatively high rates of labour absorption and labour force participation.

Labour force participation, in particular is a key indicator of the inclusivity of an economy as it indicates the degree to which people are actively engaged in the labour market (whether employed or seeking work). Low levels of labour force participation are often associated with lower levels of economic development. Cape Town's labour force participation rate was 69.8% in 2017, compared to 59.8% at a national level. This figure, however, requires context and it is essential to view it in the light of other indicators such as underemployment, long-term unemployment

²¹ World Bank, 2018:10

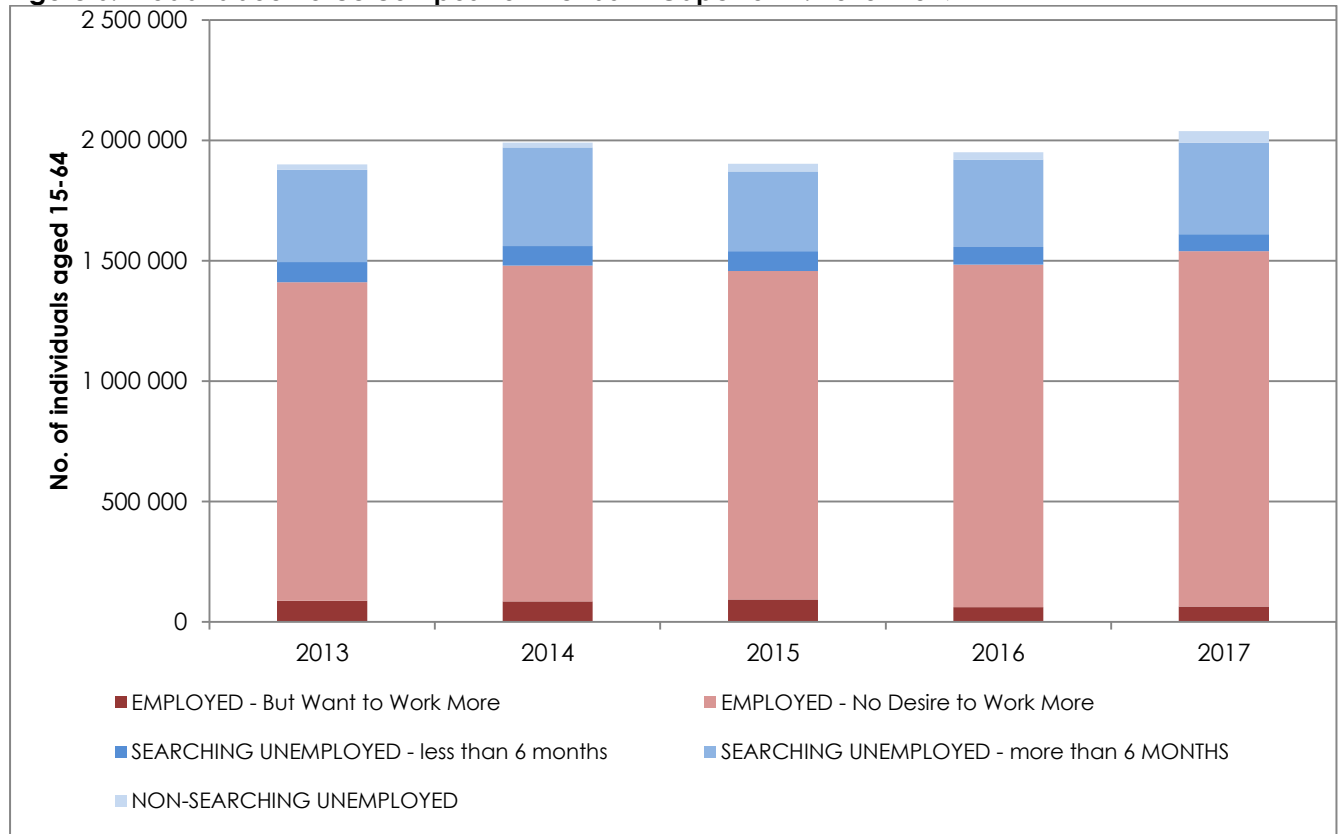
²² The growth rate of high skill/high tech-intensive industries in 2017, while higher than other low to medium-skill industries, was only 1.9%. This is as a result of the weak levels of business and consumer confidence in the national economy in 2017

²³ LinkedIn, 2017

²⁴ The broad unemployment rate differs from the strict or narrow unemployment rate by including the non-searching unemployed (Statistics South Africa, 2018b).

and discouraged work-seeking to gain a true measure of the inclusivity of the labour market. Figure 6 outlines the different components of the growth of the broad labour force in Cape Town (which includes the non-searching unemployed) over the past five years.

Figure 6: Broad labour force composition trends in Cape Town: 2013 -2017



Source: Statistics South Africa, 2018b

The quickest and most sustainable way to enhance economic inclusion is to grow employment. In this regard, Figure 6 reveals some positive movement in the past five years, with employment levels reaching a new high of 1 571 048 people by the fourth quarter of 2017. Overall employment in Cape Town grew by 1.5% in 2017. Composite employment statistics however, hide some nuances, relating to the extent to which people may be underemployed. Underemployed individuals although forming part of what Statistics South Africa accounts for as 'employed', do not consider themselves fully employed and are willing and able to make a more significant contribution to the labour market. Of the total employed population in Cape Town in 2017, just over 3.1% (63 018) indicated that they would have liked to work more if given the chance. This has come down from a figure of 4.9% (92 547) in 2015, and is an indicator of positive developments in the labour market, particularly with regard to job security.

Contrasting the employment statistics for Cape Town, the unemployment statistics do not convey a positive picture. Unemployment has risen throughout the period 2015-2017, outstripping employment growth in 2017. Similar to employment however, viewing unemployment as a discrete category fails to acknowledge the temporal dynamics associated with it. Figure 6 divides the unemployed between those who have been unemployed for longer than 6 months and those who have been

unemployed for less than 6 months. Concerning is the fact that 84% of the city's unemployed have been unemployed for longer than 6 months and that this category of unemployment grew by 4.6% in 2017. This would suggest that it becomes increasingly difficult for people to find employment as the duration of unemployment grows, with individuals gradually finding themselves shut out of employment opportunities.

Lengthy durations of unemployment may also lead to work-seekers becoming discouraged and opting out of the (strict) labour force entirely by no longer actively seeking work. Despite many individuals being unemployed for longer than 6 months in Cape Town, the incidence of non-searching unemployment remains relatively low, with only 2.3% of the broad labour force categorised as such. While this compares favourably with the rest of the country, the proportion of non-searchers has grown notably in the last five years, indicating that increasing levels of long-term unemployment may be resulting in increasing rates of discouragement.

Although employment in Cape Town continues to rise, and the conditions of employment are possibly improving, there remains a large concern that the increasing number of long-term unemployed people in the city may increase Cape Town's currently low levels of non-searching unemployment/discouragement. This could result in declining levels of labour force participation in the near future and systemic structural unemployment (as per the broad definition), undermining efforts to foster economic inclusion for everyone within the city.

Key Message

Robust economic growth has long been pursued as the foremost goal of economic development strategies, whether at a national or city-level. However, Cape Town's experience, as shown in this section, indicates that this goal cannot be pursued without due consideration of a number of other factors. Natural resource constraints – acutely evidenced by current water challenges in Cape Town and episodes of electricity load shedding – oblige businesses and policymakers in the city to take stock of the sustainability of their growth paths. Similarly, the high-skill/high-tech skewness of Cape Town's recent (and probable future) economic growth, means that, significant investments in human capital (whether by government, business or individuals) are essential to future proofing Cape Town's economy and ensuring that it remains as inclusive as possible.

Society

Overview

Cities are more than simply the infrastructure and hubs of economic activity, but are social hubs of individuals and families with different cultural backgrounds, needs and aspirations²⁵. South Africa has developed a vision by which urban dwellers have access to social and economic services, opportunities and choices²⁶. This vision is aligned with the global vision of sustainable and resilient cities as promulgated through the New Urban Agenda²⁷.

The social dimension of South African cities is important in understanding some of the factors that affect its growth and development trends. Cape Town's demographic, health, education, poverty, inequality, and crime trends provide important indications of multiple social opportunities and challenges affecting the growth and development of the city.

Key Population Trends

In 2017 the population of Cape Town was estimated to be 4 174 510²⁸ (an increase of 1.68% from 4 023 510 in 2015)²⁹. This constituted 64.12% of the Western Cape Province's population. In 2017, the population consisted of 2 056 478 (49.26%) males and 2 118 032 (50.74%) females³⁰. Households are the most basic socioeconomic institutions in society. In 2017 Cape Town had 1 304 534 households compared 1 211 900 in 2015, and the household size decreased slightly from 3.32 in 2015 to 3.20 in 2017. Thus as population increased and household size dropped, this is likely to continue to increase (low-income) housing demand in the city.

State of Health

The Western Cape Government's (WCG) Health Department and the CCT are partners in providing access to community primary healthcare services, particularly to the vulnerable and poor – which is likely to improve both the quality of services provided and health outcomes for its users. In 2016, the CCT had a total number of 132 primary healthcare facilities – 81 fixed primary healthcare (PHC) clinics, 42 community day centres as well as 9 community health centres. In addition, there are 85 ART (antiretroviral treatment) and 128 TB (tuberculosis) treatment sites as well as 2 regional hospitals (managed by the WCG) within the City's boundaries.

The average life expectancy at birth in Cape Town increased for both females and males, from 61.1 in 2012 to 64.0 years in 2017³¹. This indicates an annual rate of increase of 0.58 years, and provides an indication of improved health conditions.

HIV/Aids has been a major health concern for the country (including Cape Town) and large scale resources have been channelled into preventing both mother to child transmission, and making ARTs available to people who are diagnosed HIV+.

²⁵ People Friendly Cities in a Data Rich World. 'Why are People Friendly Cities Important?', <http://people-friendly-cities.eu/topics/why-are-people-friendly-cities-important/>

²⁶ This is one of four strategic goals of the Integrated Urban Development Framework (IUDF), CoGTA (2016) to realise South Africa's urban vision for 2030.

²⁷ DHS (2018) for example observed broad alignment between the IUDF and the New Urban Agenda.

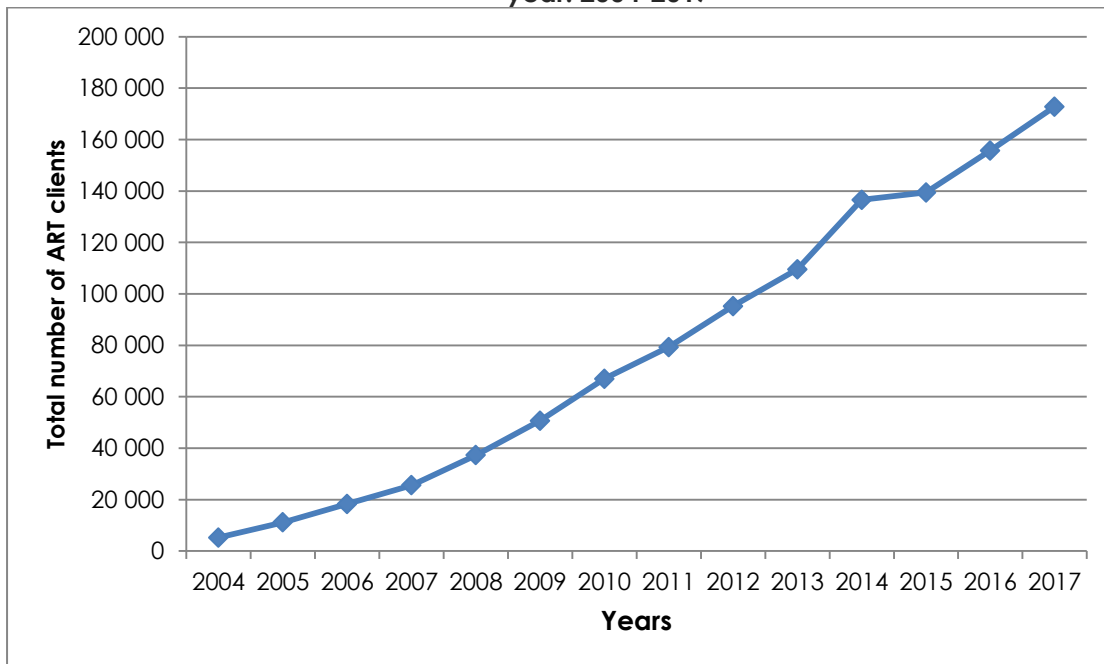
²⁸ City of Cape Town, Organisational Policy and Planning (OPP) Department using StatsSA Data, 2017

²⁹ An annual increase rate of 1.87% in 2017

³⁰ Statistics South Africa, 2017 Mid-Year Estimates

³¹ Statistics South Africa, 2017 Mid-year estimates

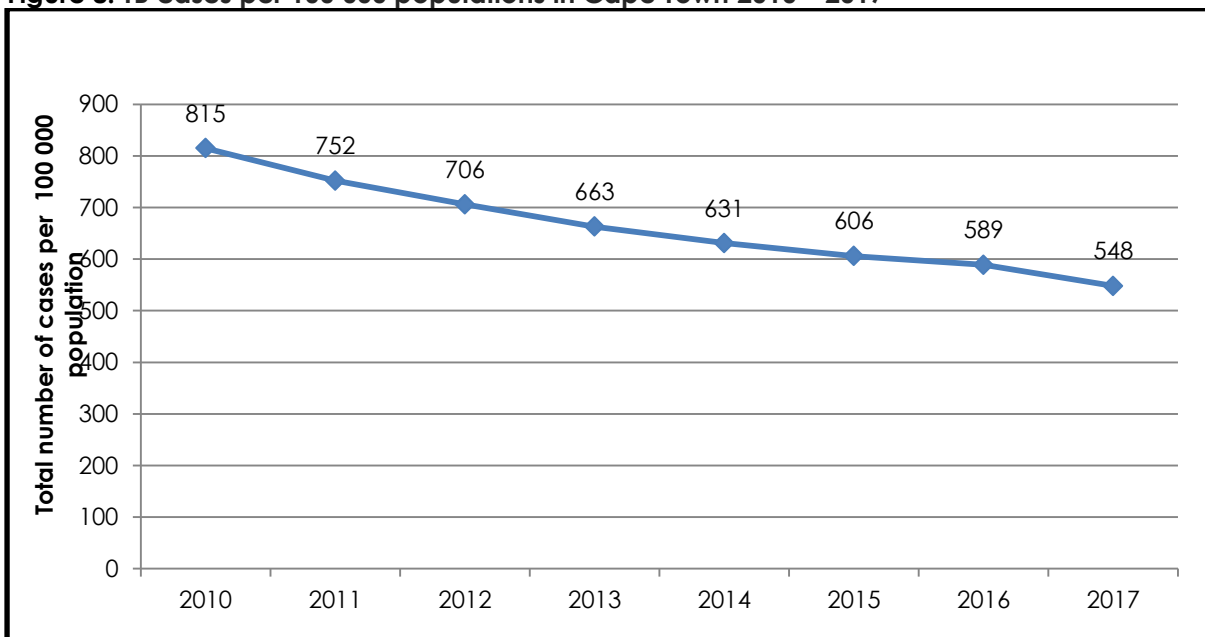
Figure 7: Cumulative total of patients who were in care on ART at the end of the calendar year: 2004-2017



Source: City of Cape Town, City Health Department, 2018

The number of people living with HIV in Cape Town in 2017 was estimated at 300 424. The HIV prevalence rate was 7.5%. The number of Cape Town residents with HIV/Aids who are registered for ART at the City's clinics continue to increase steadily (figure 7). A total number of 172 809 clients remaining on ART is recorded for Cape Town in 2017, compared to 139 419 in 2015³². This equals a total of 19.32% increase over two years. Access to health care and ART is of continuing importance for HIV+ people to maintain a healthy quality of life.

Figure 8: TB cases per 100 000 populations in Cape Town 2010 – 2017



Source: City of Cape Town, Health Department, 2018

³² Massyn et al, 2017

TB an opportunistic infection that especially affect HIV+ people (whose immune systems are depressed by the disease) reduces the affected individuals', households' and communities' resilience to unexpected stresses and shocks associated with sudden social and other unexpected challenges. As such, improved access to ARTs will likely bring positive health impacts for people living with HIV/Aids, including potential declines in TB incidence.

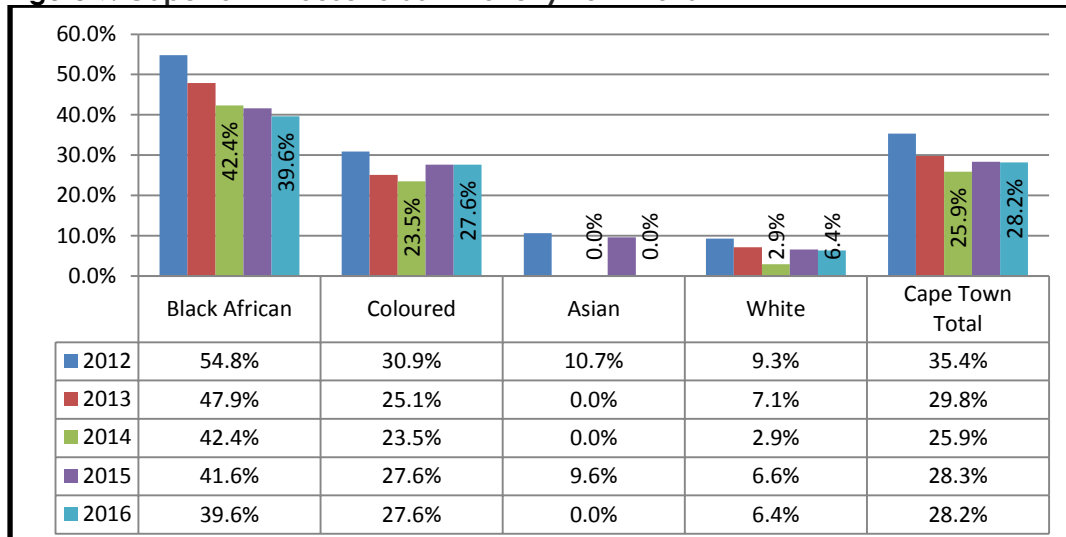
There has been a general downward trend in TB cases since 2010 in Cape Town (figure 8). The treatment and management of patients with drug-resistant (DR) TB has also seen a decline in Cape Town from a high of 1 281 in 2014 down to 1 045 cases in 2017³³. The decline suggests improvements in TB outcomes being achieved in recent years.

Public Health and health outcomes are not only affected by healthcare or access to health services. They result from multidimensional and complex factors linked to the social determinants of health. However the health sector needs to play its role in providing a broad range of health services to reduce the burden of disease. There is a need within the health sector to ensure that not only curative, but preventive and promotive primary health services are accessible to Cape Town residents³⁴.

Poverty and Inequality

Poverty³⁵ in Cape Town is still widespread (figure 9) and in recent years, the proportion of households living in poverty has remained stable at 28.3% in 2015 and 28.2% (less 0.1%) in 2016, following an increase from 25.9% in 2014. There has been a gradual decline in poverty amongst the Black African population group from 54.8% in 2012 to 39.6% in 2017, while poverty levels among Coloured households increased but remained below 2012 levels.

Figure 9: Cape Town Households in Poverty 2012-2016



Source: Compiled by the Organisational Policy and Planning Department, City of Cape Town using Statistics South Africa 2017 General Household Survey

³³ City of Cape Town, City Health Department, 2018

³⁴ Gray et al, 2017

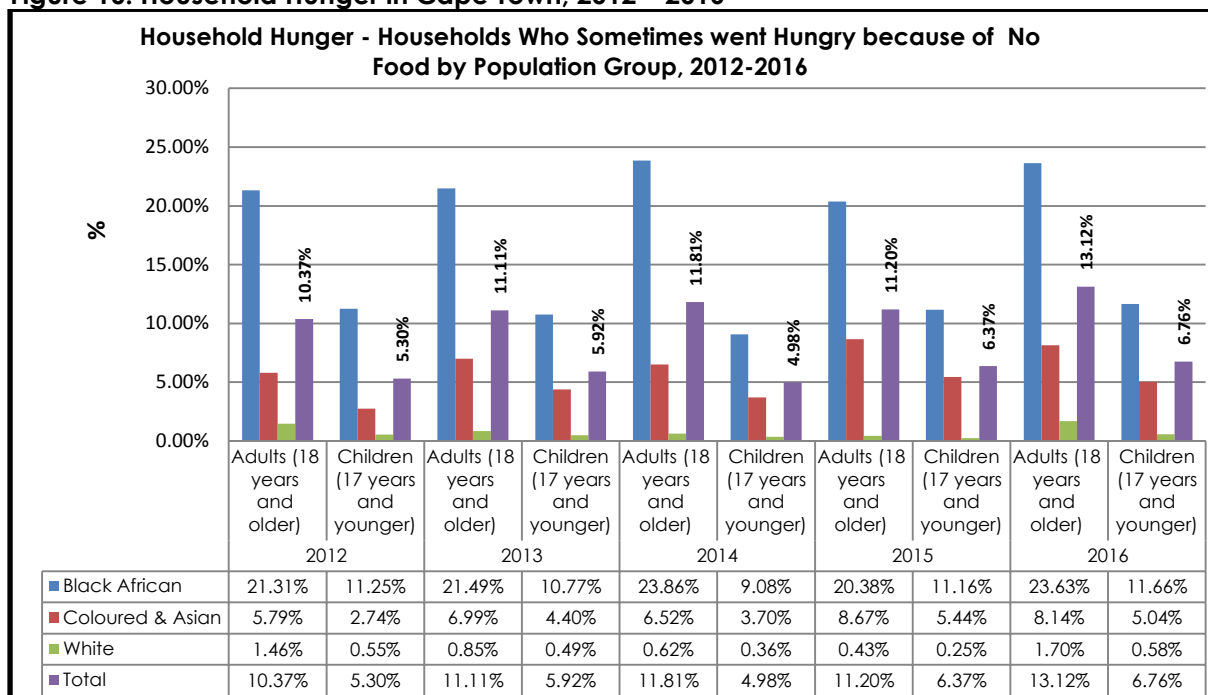
³⁵ Poverty in this context refers to households earning R3 500 or less per month. This excludes households with an unspecified income.

Poverty has multiple dimensions, and consists of several aspects that contribute to deprivation, including inadequate and/or insecure income, poor health, a low living standard, and disempowerment. Poverty and marginality dominate the sprawling townships and established informal settlements on the Cape Flats. The Townships on the periphery of the city house many poor residents. The majority of the city's residents, mostly coloured and black African, predominate among the poorest households. Although some township areas are huge and constitute towns (with CBDs) in and of themselves, evidence of a vibrant township economy – including job-creation in these communities – is still scarce and the majority of marginalised communities' and households' livelihoods are still eked out in the informal and survival sectors of the economy.

Food Security

Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life³⁶. Food insecurity amongst the urban poor is a public health challenge driven by resource inefficiency (e.g. food shortages as a result of drought) and insecurity – and has been linked to detrimental health outcomes. More recent analyses of urban food insecurity also suggest that the food security challenge is also a result of food (spatial) accessibility and affordability³⁷.

Figure 10: Household Hunger in Cape Town, 2012 – 2016



Source: Compiled by the Organisational Policy and Planning Department, City of Cape Town using Statistics South Africa 2017 General Household Survey

Robust indicators –and hence data availability –to monitor urban food security are not well established and difficult to source³⁸. Data on hunger in Cape Town (Figure 10) show an increase since 2012 in the proportion of households where both adult and children went hungry over a period of 12 months due to food shortage.

³⁶ FAO, 2008

³⁷ Van Breemen, 2014

³⁸ Haug, 2018

A prolonged drought in the Western Cape could reduce food production and could increase food prices, particularly in Cape Town. Overall, whilst South Africa and Cape Town remain food secure, there exists a prevalence of hunger at the household level – impacted by unemployment, poverty, and being food insecure³⁹.

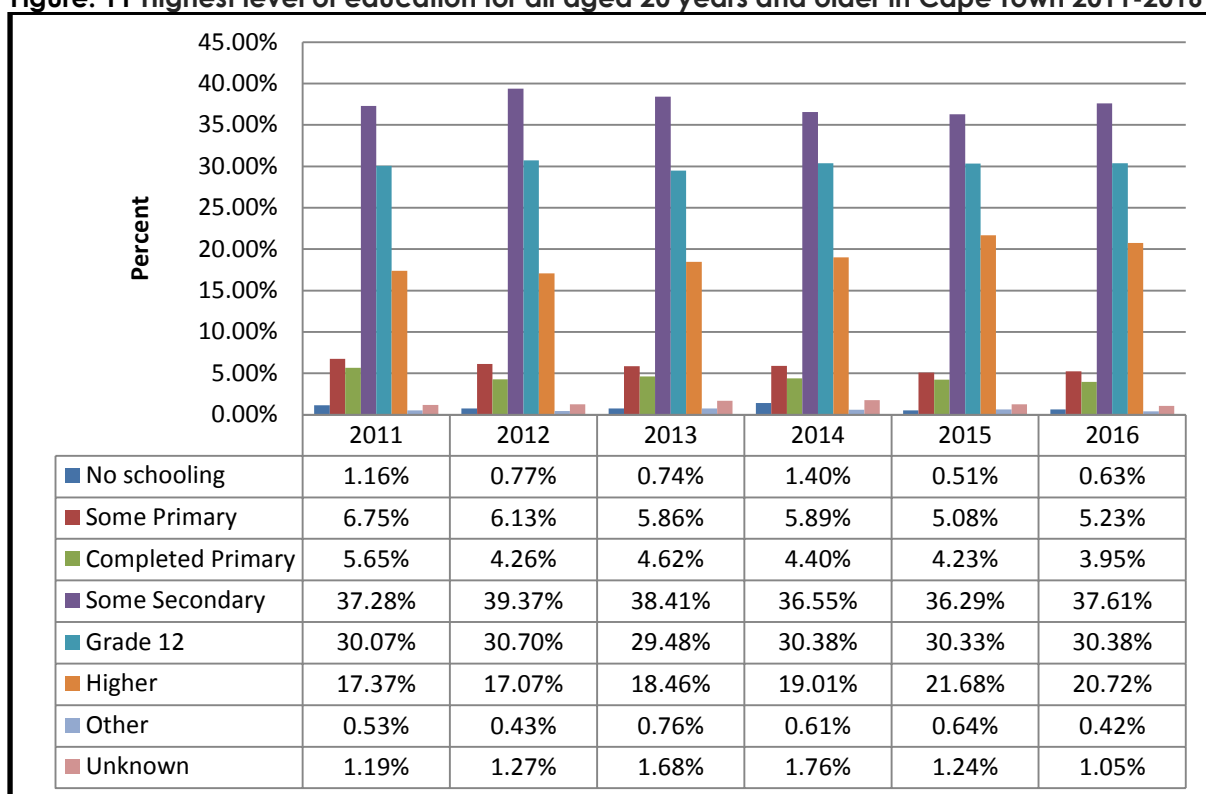
Education

Historically, education has played a vital role in facilitating inter-generational upward social mobility and to mitigate against long term risk in the broad social and economic environment.

Literacy levels are gradually increasing nationally and in Cape Town, with literacy rates being a key social indicator of development. Cape Town has the largest proportion of literate adults (as a percentage of total population in South Africa) with 98.9% being able to read and write in at least one language⁴⁰.

While the proportion of all aged 20 years and older who completed matric as the highest level of education remained relatively steady between 30.07% in 2011 and 30.38% in 2017 (figure 11); the proportion of those with higher education increased from 17.37% to 20.72% over the same period. The proportion of those with no schooling declined from 1.16% to 0.63% over the period.

Figure: 11 Highest level of education for all aged 20 years and older in Cape Town 2011-2016



Source: Compiled by the Organisational Policy and Planning Department, City of Cape Town using Statistics South Africa 2017 General Household Survey

³⁹ SAMJ, 2015

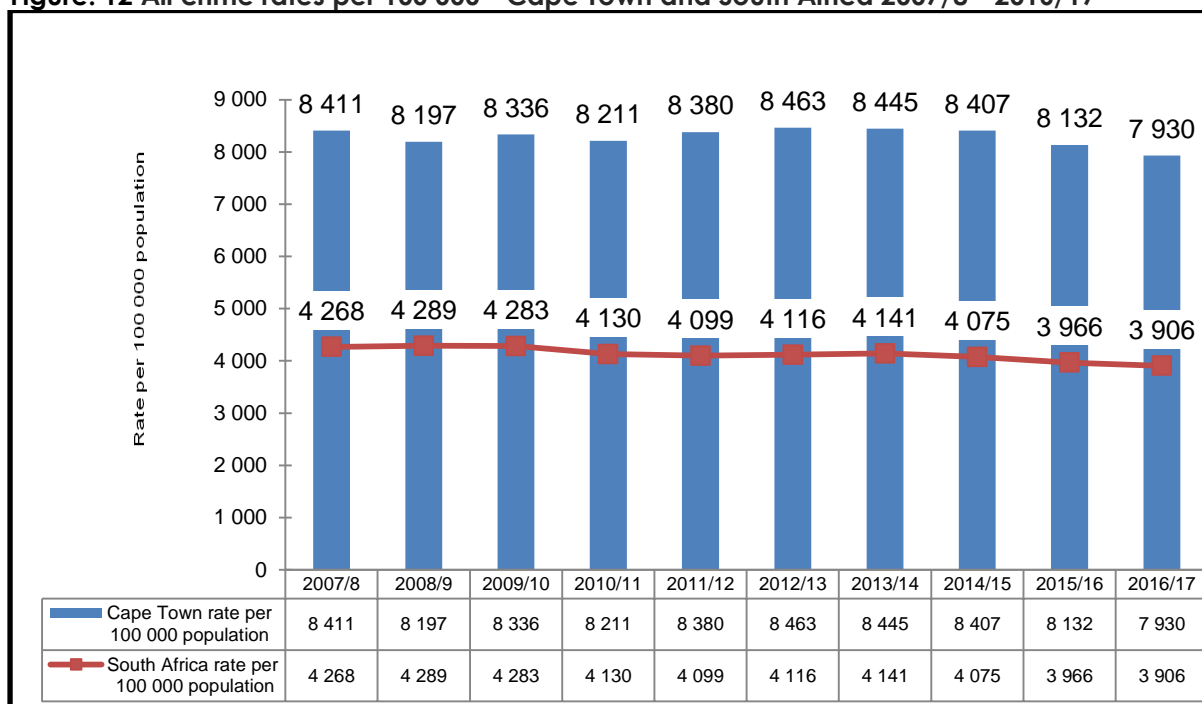
⁴⁰ Statistics SA (2016); Makhubo, 2016

The high levels of literacy provide a strong acknowledgement of the role of education and life skills, with it enabling individuals and households to better manage conflict and stressors in their lives, and thus building greater personal, family, household and/or community resilience. Illiteracy and lower education levels limit access to information on available resources and possible actions – and can negatively impact resilience at a range of levels when faced with disasters or stressors in the environment.

Safe Communities

Urban safety is recognised globally as a basic human right, a public good, and essential for urban development⁴¹. The rise of crime and violence is therefore an important urban development challenge – more so in South Africa and specifically in Cape Town with violent crime rates which are regarded as well above global and national averages⁴².

Figure: 12 All crime rates per 100 000 - Cape Town and South Africa 2007/8 - 2016/17



Source: South African Police Services (2017). *Crime Statistics 2007/8 – 2016/17, Cape Town and South Africa population estimates using Statistics South Africa 2017 mid-year estimates, (SSA, 2018) compiled by the Organisational Policy and Planning Department, City of Cape Town*

Cape Town's crime statistics highlight a major challenge for the City and its residents. Cape Town continues to experience the highest contact crimes (which includes murder, attempted murder, sexual crime and common assault crime), and experiences the highest rate of robbery with aggravated circumstances, as well as the highest murder rate. Crime statistics for 2016/2017 (Figure 12) show a decrease in

⁴¹ The IUDF recognises that fear of violence and crime prevents residents from benefiting from the economic, social and cultural opportunities offered by cities, and calls for safety to be mainstreamed in the different sectoral plans and programmes (COGTA, 2016). Also see: <http://unhabitat.org/urban-themes/safety/>

⁴² Several global flagship reports highlight the nexus of crime and violence in urban areas, including various travel warnings, report of high level of crime, including rape and murder in South Africa. See SACN, 2016b

overall reported crime rate (per 100,000 population) between 2007/8 to 2016/17 for Cape Town.

Gang violence is a major problem in Cape Town and the city's high murder rate⁴³ is closely linked to high levels of gang activity in and around the city⁴⁴. The effect of gang culture of violence pervades the lives of many on the Cape Flats, where gang membership is high, fuelled by a combination of school drop-outs, no job opportunities and the lucrative fruits of illegal activity such as the drug trade.

Gang activities impact the health and welfare of the individual households and communities, especially youth. Gang activities and involvement can have varying degrees of short and long-term negative outcomes and lifelong effects and problems within communities such as drug abuse, social disorganization, unsafe high crime neighbourhoods; including high poverty and youth in trouble as well as mental health impacts and trauma.

The City is increasingly considering the role it plays and can play as a community safety and security provider. Although an important contributory factor, the security of the city is not limited to only effective policing. Another key factor is the risk posed by stresses⁴⁵ and shocks, either anticipated or unanticipated, and the need to facilitate the development of adequate coping mechanisms by individuals, households and communities. Removing these impediments to the successful development of a city therefore requires a focus on inclusive resilience and safety as elements of a coherent and integrated sustainable urban security strategy⁴⁶.

Key Message

The benefit of improving health and education levels and addressing the high levels of violence in the city may be that residents will increase capacity and know-how to manage personal and community trials, building both personal resilience and adding to collective ways to deal with adversity and heightened capacity of the CCT's efforts to build resilience in the city.

Safety of public spaces and within communities impacts profoundly on the mobility and quality of citizens' lives and their opportunities to participate in public life and developmental processes. The CCT has prioritised community safety and strives to create an increased sense of community and personal safety. While Cape Town has improved on some of its crime trends over the last decade, it is still impacted by high rates of violent crime. Cape Town's murder rate is more than double the national average – driven by high rates of gang activity. The success of CCT urban development interventions in Cape Town will in part turn on the success in addressing the high levels of violent crime and gang activity in the low income areas in Cape Town. Increasingly Cape Town residents are indicating that their tolerance of gang activity and violence has eroded, demonstrating this through street protests⁴⁷.

⁴³ South Africa's national murder rate is about 34 per 100 000 (2017). Cape Town has a high murder rate of 61 per 100 000 population in 2016/17 down from 63 per 100 000 population in 2014/15. This almost two-times the country's average rate in 2016/17 (Organisational Policy and Planning Department, CCT).

⁴⁴ BusinessTech, 2017

⁴⁵ The Rockefeller Foundation defines stresses as forces that weaken the fabric of a city on a daily basis and shocks as sudden events with major disruptive effects.

⁴⁶ Arup, 2018

⁴⁷ See for example Isaacs, 2018

The CCT seeks to facilitate the emergence of building more socially diverse and healthy communities in Cape Town. An important part of this will be to find ways to facilitate collaboration and partnerships across communities that will help build social resilience in the city. The CCT views urban resilience as a core factor in building a resource efficient and secure city.

Natural Environment

Overview

Cities are increasingly altering the relationship between society and the environment, and affecting cities' sustainability and resilience in complex ways at alarming rates⁴⁸. It is important for cities to understand these robust relationships where its citizens (residents and business) live, learn, play and work as well as how the biophysical, socio-economical and built environment impacts on the natural environment.

Cape Town hosts a unique natural environment providing a number of irreplaceable ecosystem goods and services and associated economic and social benefits to its people. This is a common asset that belongs to all its citizens, and must remain accessible and deliver benefits to both current and future generations. However, many socio-economic challenges stemming from the city's historical and current socio-economic inequalities hinder the ability for all citizens to gain access to the benefits of the natural environment. These include, amongst others, rapid urbanisation, pressure on finite resources, capacity to manage scarce resources, pollution, and exposure to the risk of natural hazards.

The CCT has developed a number of strategies, policies, plans, programmes and projects in order to ensure that its natural environment remains accessible to future generations. The City's environmental vision is to enhance, protect and manage Cape Town's natural and cultural resources for long-term prosperity, in a way that optimises economic opportunities and promotes access and social well-being⁴⁹.

Key Environmental Trends

More land is being proclaimed for conservation by the CCT, but biodiversity remains under threat⁵⁰. Energy demand and supply will continue to increase with a business-as-usual approach unless serious adaptation measures are implemented. A good adaptation example is that of the City's energy efficient public buildings where a significant reduction in energy consumption from City buildings is observed between 2012 and 2017. Water scarcity will be the 'new normal' for Cape Town. Continued reductions in water consumption –which has been observed between 2009 and 2017 –will be critical. Solid waste recycling in Cape Town has improved particularly from 2015 onwards.

Natural Resource Management

Cape Town is situated within a biodiversity hotspot surrounded by floodplains, estuaries and coastlines. Biodiversity fragmentation critically impacts⁵¹ and threatens indigenous species survival. In Cape Town, these ecosystem pressures are due to habitat loss (urbanisation, fires, over-exploration, invasive alien plants) and land degradation.

The CCT manages various types of natural resources in the form of biodiversity networks (BioNet)⁵², open spaces, community parks, greenbelts, wetlands (vleis) and

⁴⁸ Romero-Lankao et al, 2016

⁴⁹ City of Cape Town, 2017a

⁵⁰ City of Cape Town, 2018d

⁵¹ Cities and Biodiversity outlook, Action and Policy, Secretariat of the Convention on Biological Diversity

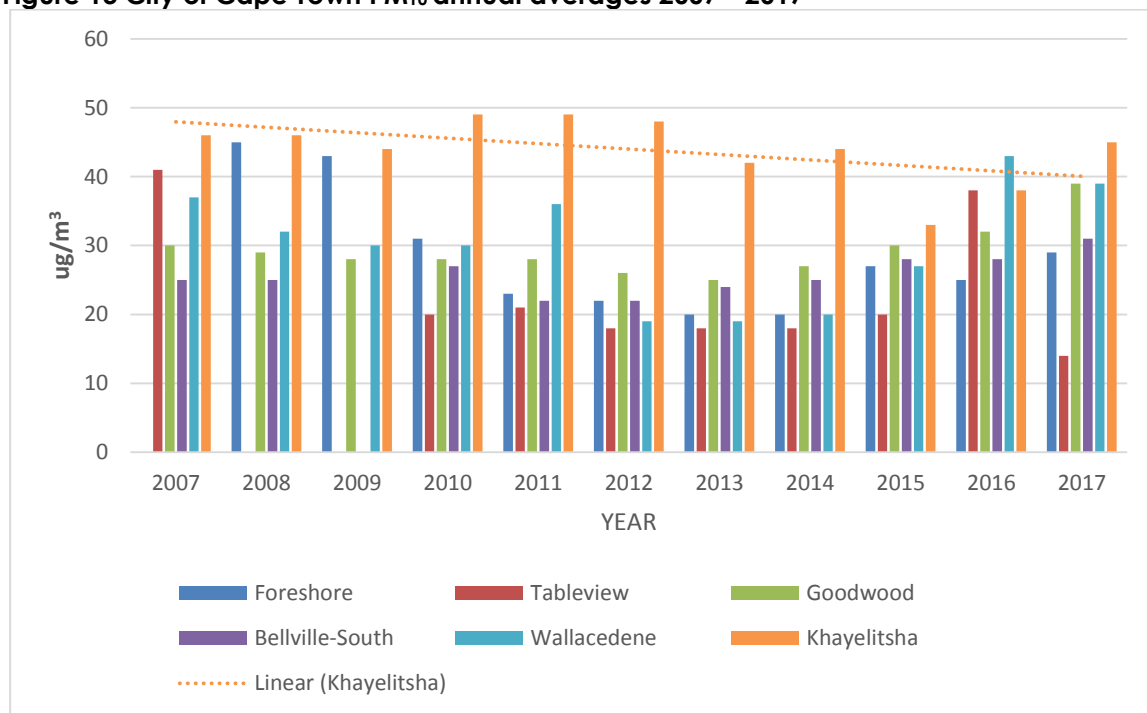
⁵² By 2014, 60.81% of the BioNet had been formally conserved, rising to 64% in 2016. This steady increase has put the City on track to reaching its 2019 target of 65% of the BioNet conserved. The BioNet covers

many more. This increases Cape Town's resilience levels against natural shocks such as floods.

Air Quality

In Cape Town, veldfires, open spaces with little or no vegetation, road transport, wood and fuel burning and the manufacturing industry are among the factors impacting on ambient air quality levels in the city⁵³. PM₁₀ (particulate matter smaller than ten microns in size) is a good indicator to monitor air quality. Particulate matter is so minute and poses a significant risk to human health as it can be inhaled and cause chronic respiratory diseases⁵⁴.

Figure 13 City of Cape Town PM₁₀ annual averages 2007 - 2017



Source: City of Cape Town, Health Department, June 2016 & 23 January 2018

The CCT uses sensors across 14 air pollution monitoring stations spread across Cape Town to measure the concentration of ambient air pollutants in ten second scans and the values are shown as one hour averages⁵⁵. The South African ambient air quality annual average standard is less than 50 µg/m⁵⁶ and Figure 13 presents an annual average for air quality over six stations in Cape Town over a 10-year period. The data illustrate that, with reference to the South African standard, all Cape Town stations measure consistently below the annual average standard. Khayelitsha displayed consistently high levels, which could be attributed to factors such as dust from construction activities, unpaved roads or wood and coal burning for heating purposes during winter. These levels are likely to improve with urban development interventions in Khayelitsha.

a total of 87 902 ha of land, with 85.6% of the land being outside the urban edge (City of Cape Town, 2018d: 14).

⁵³ City of Cape Town, 2016

⁵⁴ Ibid: 73

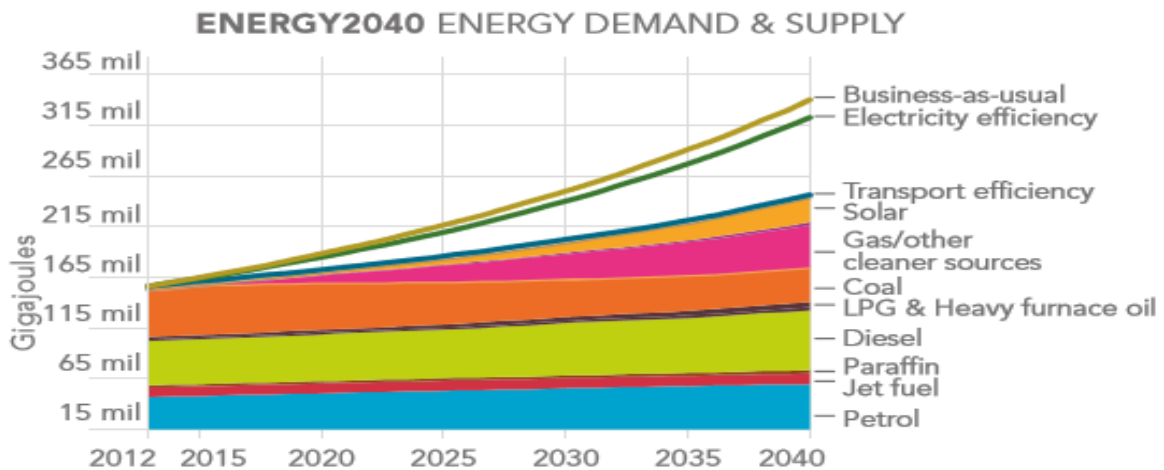
⁵⁵ City of Cape Town: Open Data Portal

⁵⁶ National Environmental management: Air Quality Act 39 of 2004, National Ambient Air quality standards

Energy

Cape Town has adopted a resource efficiency approach that seeks to mitigate dependency on fossil fuel, promote a less carbon intensive approach thus reducing the city's greenhouse gas (GHG) emissions and encourage the use of alternative energy sources for consumption⁵⁷. The use of alternative sources promotes a sustainable dependable and stable energy mix that allows the city to increase its flexibility to adapt.

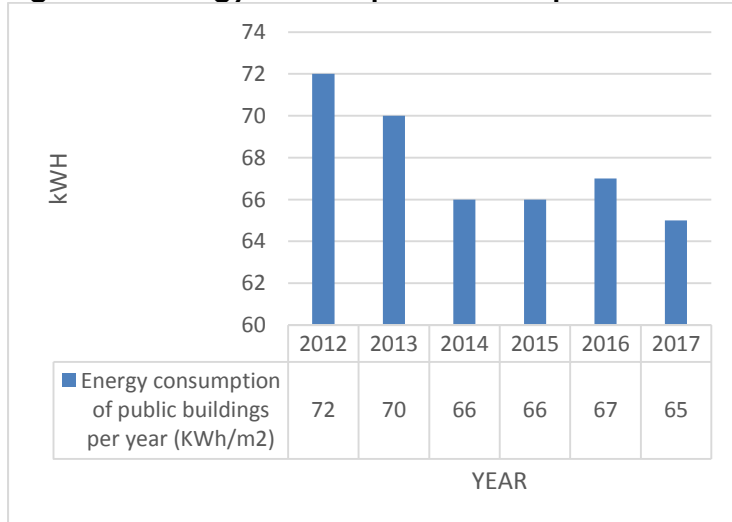
Figure: 14 Projected energy demand and supply projected 2012 - 2040



Source: City of Cape Town, 2015a

Figure 14 presents a projection for energy demand and supply in Cape Town for various energy sources until 2040. It highlights that especially electricity consumption increases considerably by 2040 and suggests that should Cape Town not find alternative energy sources for electricity, grid dependency will be substantial.

Figure: 15 Energy consumption of CCT public buildings per year (KWh/m²)



Source: City of Cape Town, 2015a

Figure 15 reflects the past few years' energy consumption in CCT buildings with slight decreases seen in the consumption of electricity in municipal buildings as the City is

⁵⁷ City of Cape Town, 2015a

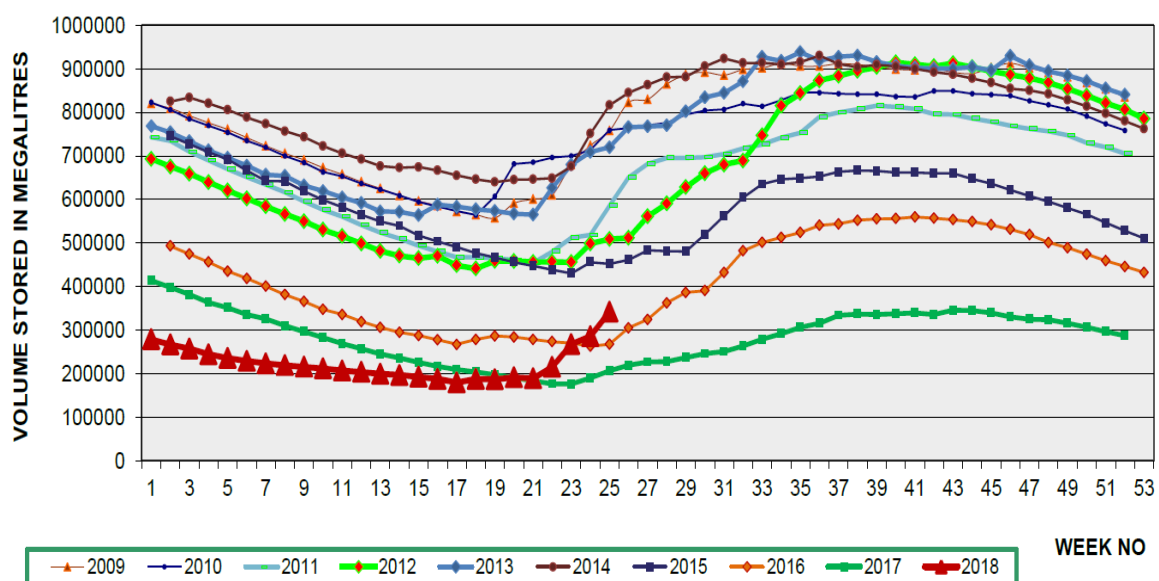
slowly consuming less electricity. The CCT monitors its own energy consumption in its buildings with over 220 smart meters installed in CCT buildings and facilities (as at June 2015).

In addition to the City's contribution to energy reduction, the Western Cape Government (WCG) reported reduction in energy consumption in 35 of the WCG office buildings by 6% for the period April 2016 to March 2017⁵⁸.

Water

Cape Town's water is supplied from a system of dams –referred to as the Western Cape Water Supply Systems (WCWSS) –located around Cape Town and managed by the national Department of Water and Sanitation. The water supply system is heavily dependent on rainfall. About a third of the water in this system is used by agriculture and 7% by other urban areas (smaller towns). Rainfall records going back to 1928, reflects that in Cape Town 2017 received a third of an average year's rainfall, and that the city's catchment areas have seen the worst drought on record. Rainfall in 2015 and 2017 respectively were the lowest recorded, with Cape Town experiencing three consecutive low rainfall years. This level of drought has not been witnessed in the City for the past 150 years⁵⁹.

Figure: 16 Ten year graph indicating volume of water stored in major dams comprising Western Cape Water Supply System (WCWSS)



Source: City of Cape Town water dashboard, 18 June 2018 (published on the CCT's website)

Figure 16 presents a ten-year trend data analyses of water storage in the City's dams covering the period 2009 – 2018 and indicates that storage in 2018 was the lowest over the ten-year period. This reflects the current drought scenario.

The CCT introduced the Day Zero concept as an awareness campaign, to deepen understanding of the scale of water savings needed by residents and business. Cape Town's drought has seen strict water consumption restrictions implemented from February 2018 on all sectors, such as reductions of 45% for non-residential

⁵⁸ Western Cape Government Property Efficiency Report, 2016/2017

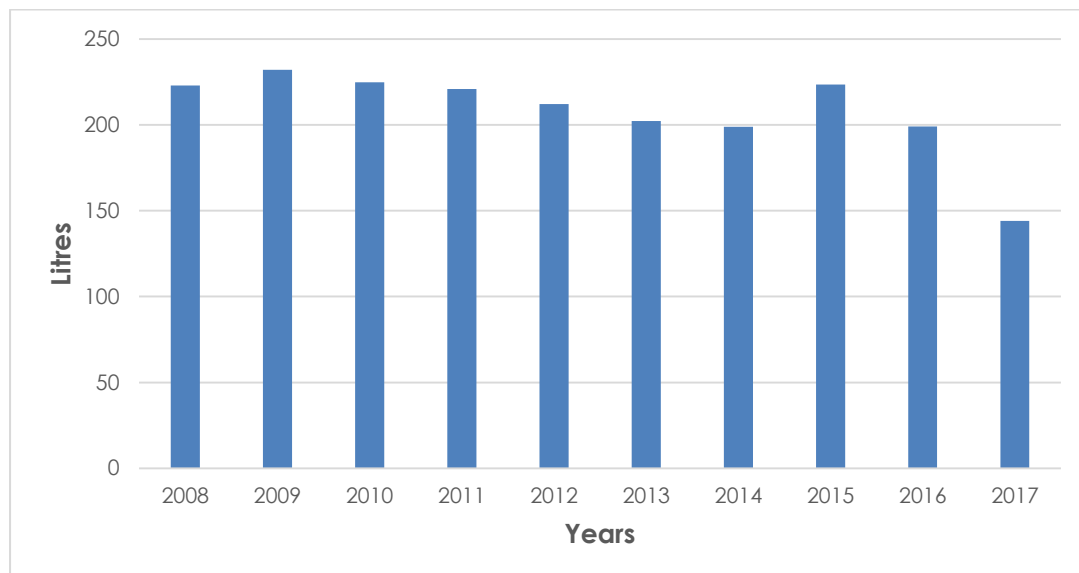
⁵⁹ City of Cape Town, 2018e

customers, 50 ℓ per capita/day for individuals and 6 kℓ per household per month. Water restrictions may be amended accordingly as the WCWSS dam levels increase or decrease, based on rainfall.

The subsequent drop in water consumption levels by a highly responsive Cape Town resident and business community – with the assistance also of farmers in the Western Cape, helped to extend the duration of the available water. “Day Zero” has subsequently been announced as “deferred” provided that adequate water restrictions are maintained⁶⁰, including through managing demand for water as well as implementing water augmentation programmes⁶¹.

It is estimated that water augmentation programmes initiated by the CCT during 2018, may add approximately 12% to the current dam levels, which is below what is required to sustain Cape Town's water requirements.

Figure: 17 Daily water consumption per person per day 2008-2017



Source: City of Cape Town Water and Sanitation department, 6 June 2018

Figure 17 presents the water consumption trend from 2008 – 2017. From 2008 to 2016, consumption was approximately 200 ℓ per day/capita, with 2017 seeing a decrease in consumption to below 150 ℓ per day/capita. The decrease reflects residents' ability to adapt to their surroundings during or leading up to a potential crisis before the level 6B restrictions were implemented. During the Level 6B stage, water consumption was even further reduced to 50 ℓ per person/day. The overall daily consumption target for Cape Town is 450 million litres per day (MLD) of which approximately 150 MLD is consumed by industry, commerce and government and daily individual consumption is limited to 50 litres per capita per day [lcd].

The significant reduction in water consumption between 2015 to 2017 (figure 17) is a reflection of a water demand management plan and an indicator of the responsiveness of Cape Town's residents to change and ability to adapt to the shock (drought) experienced.

⁶⁰ City of Cape Town, 2018c

⁶¹ City of Cape Town, 2018e

It is estimated that water demand will readjust (after the end of the drought) to approximately 80% of the demand prior to the drought. Thereafter demand is projected to grow at 3% per annum to cater for the population and economic growth⁶². Identifying alternative water sources is therefore a necessity to supplement the below average rainfall, which climate change projections suggest will become the norm in the years ahead⁶³. Numerous augmentation programmes such as piloting a desalination plant, designing a wastewater reuse treatment plant as well as future initiatives to eradicate alien species have been identified⁶⁴.

The CCT is utilising technology to create awareness and affect water-saving behaviour change by disseminating water messages to residents. A citywide water map of household consumption levels, the water dashboard as well as electronic sign boards visible to all road users are a few of the technological methods under use.

Solid Waste

Solid waste affects a city's public health, the environment and a waste management crisis can severely impact city life. Uncollected solid waste presents an environmental health risk, blocks drains, attracts rats, causes stormwater flooding and spreads waterborne diseases⁶⁵.

Currently, the CCT provides a 99.74% waste collection service in informal settlements and a 100% service in formal communities⁶⁶. The CCT recently started operating a Waste-to-Energy plant⁶⁷ which positions CCT as an actor in the green economy space. This initiative helps reduce waste to landfill, and the resultant GHG emissions – i.e. methane - as well as the long-term demand for landfill air space.

Biogas generation recovers waste materials that would otherwise pollute landfills; prevents the use of toxic chemicals in sewage treatment plants, and saves money, energy, and material by treating waste on-site. Moreover, biogas usage does not require fossil fuel extraction to produce energy. With the waste to energy plant going into production, the CCT has become an energy producer, which in time could present Cape Town businesses and residents with choice in their energy consumption.

Figure 18 presents the City's waste going to landfill and shows the steady increase in waste being diverted from landfill between 2010 – 2017, and the more rapid increase in diverted waste over the three-year period between 2015 – 2017. This in part reflects the growing awareness of a range of intersecting trends - limited landfill life spans, the economic value of waste, alternative use of waste as a resource and opportunities created by technology innovations linked to waste management and waste monitoring and tracking systems. Technology uptake such as the Radio-

⁶² Ibid

⁶³ Climate change scenarios for South Africa suggest a tendency towards a significant decrease in the number of rain days in almost all hydrological zones. This implies that there will be an increase in the intensity of rainfall events and increased dry spell duration (Department of Environmental Affairs, 2013).

⁶⁴ Ibid

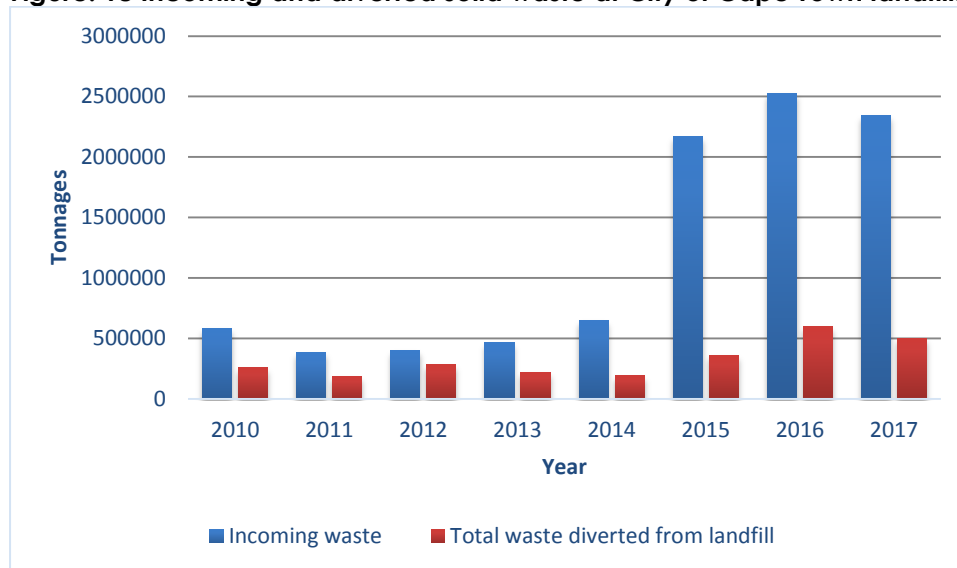
⁶⁵ United Nations Habitat, Solid Waste Management in the World's Cities pre-publication presentation, 2010

⁶⁶ Solid Waste Management, GIS, (May 2018)

⁶⁷ City of Cape Town, 2017d

frequency identification [RIFD] tags, recycled wheelie bins and weighbridge systems innovations reflects the sector – and City's shift towards technology use to monitor waste infrastructure and tonnages.

Figure: 18 Incoming and diverted solid waste at City of Cape Town landfills 2010-2017



Source: City of Cape Town Solid Waste Management GIS, May 2018

Key Message

To ensure that the natural environment remains accessible to future generations it is critical that the CCT continues maintaining and possibly extending its biodiversity network, as well as maintaining its open spaces, community parks, greenbelts and lakes (vleis). These would also strengthen the city's resilience against natural shocks, for example by absorbing excessive run-off from intense rainfall events, and help replenish the underground water resources for use in future drought occurrences.

The quality of the city's air has a direct impact on the health risk to the population. The continuous monitoring by the CCT of its ambient air quality plays a significant role in informing the effectiveness of implementing relevant policies and programmes and identifying where targeted interventions are required.

Cape Town is heavily depended on fossil-fuel and coal-based energy sources thus making it vulnerable to rising fossil fuel prices, and the effects of GHG. This dependency has a multi-sectoral impact affecting the economy, health, social, technology and various other sectors in both urban and non-urban settings. Alternative energy sources are unquestionably needed for Cape Town, as future behaviour change modelling and newer technologies are advanced⁶⁸. The City is through the Energy 2040 report promoting sustainable energy use and identifies the need for resource efficiency, retrofitting and security^{69,70}.

Water scarcity will become the "new normal". Cape Town, being a coastal city, will increase its resilience by diversifying its water supply systems (i.e. including

⁶⁸ Energy Future Report: Cape Town, 2015

⁶⁹ State of Environment Outlook Report for the Western Cape Province – Energy. November 2017

⁷⁰ City of Cape Town, State of Energy Report 2015

desalination and groundwater), thus moving away from surface water dependence. In addition to the CCT's Water Resilience Programme [WRP]⁷¹, the CCT is also partaking in the 100 Resilient Cities Initiatives and is in partnership with ARUP to develop a City Water Resilience Framework (CWRF) tool that deals with too little or too much water as well as to measure the resilience of the water system⁷².

The CCT is close to providing 100% waste collection services to all its residents. It is also strengthening efforts to reduce waste-to-landfill through increasing its recycling programmes as well as more recently implementing waste-to-energy plants. City policy focus on the Green Economy –with a particular emphasis on the Circular Economy –would ensure that waste's cradle to grave approach promotes economic benefit (redesigning), reduces social impact (increase public health) and decreases the use of virgin material in manufacturing (recycling).

⁷¹ Voutchkov, N., 2017

⁷² Global Solutions Networks, 2018

Built Environment

Overview

In this *urban age* it is critical that the urban system is resilient to uncertainty, adversity and change. Urban form can be resilient in how it changes and adapts to accommodate different needs and circumstances. This can be either through physical change and growth (e.g. changes to road networks, city expansion, shift from low-density to high-density buildings, or adding new public spaces) or through the way it functions (e.g. land use change)⁷³.

The CCT's *Integrated Development Plan (IDP) 2017 – 2022* embraces the principles underlying resilient urban form. This is evident in the IDP's emphasis on dense and transit-oriented growth and development. The City actively promotes an urban form with higher densities and mixed land use patterns in a central development core, surrounded by transport zones and a bus rapid transit (BRT) and rail network. The IDP also emphasises the use of technology for furthering development progress.

Key Built Environment Trends

The City strives to deliver quality basic services, as well as maintain and expand its services as is evident in the well over 90 per cent access to all basic services between 2012 and 2016. Informal dwellings increased slightly between 2011 and 2016. The provision of housing located close to economic opportunities remains a challenge, however the City is responding using an integrated approach. A revised spatial framework is intended to ensure Cape Town's urban form has higher densities, mixed land-use with equitable green spaces and transit-oriented development (TOD)⁷⁴. The Transport Development Authority is ensuring that Cape Town has an efficient and integrated transport system. However the city remains challenged by the high use of private vehicles resulting in ongoing traffic congestion challenges⁷⁵. Cape Town's integrated transport infrastructure network includes 1014 km of rail network, 32 km of dedicated red road for the City-owned Bus Rapid Transit (BRT), 440 km of cycling lanes and 109 foot bridges for pedestrians⁷⁶. Cape Town is offering easy access to internet connectivity, a key factor for adapting to the new urban age. The 5 years between 2012 and 2016 witnessed an increase in internet and cell phone access by Cape Town residents.

Dense and transit-oriented growth and development

A compact city form is considered key to urban sustainability and resilience. Dense mixed-use neighbourhoods allow for the effective and efficient functioning of all types of business, social and cultural activities within close proximity, which then requires relatively low inputs of energy for transportation (of goods, services and people)⁷⁷. This integration of urban functions is further enabled through transit-oriented development (TOD) and integrated transport systems.

The City of Cape Town's Municipal Spatial Development Framework (MSDF) sets guidelines on how and where Cape Town should grow in the future. The revised MSDF for Cape Town approved on the 25th April 2018, provides policy certainty to

⁷³ Harrison et al, 2014

⁷⁴ City of Cape Town, 2018b

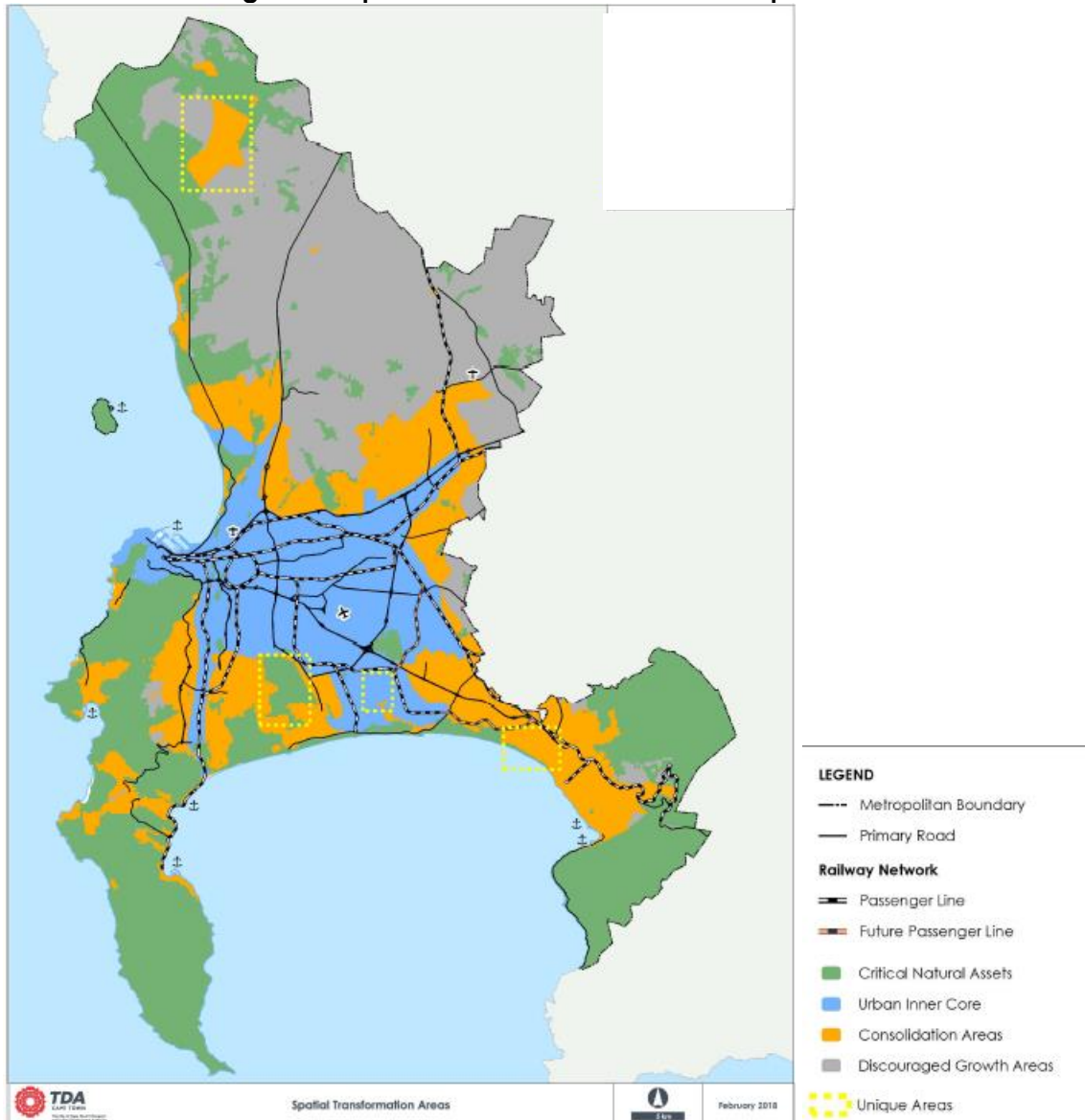
⁷⁵ Also see City of Cape Town, 2015b

⁷⁶ City of Cape Town, 2017c

⁷⁷ Ibid

private and public developers, and prioritises public expenditure on an Urban Inner Core (figure 22). It further seeks to curb urban sprawl by focusing on inward growth rather than on the city boundaries and TOD accompanied by higher densities and land-use diversification. The revised MSDF is intended to transform Cape Town's spatial form by bringing people closer to jobs, and jobs closer to people⁷⁸.

Figure 22: Spatial Transformation Area for Cape Town



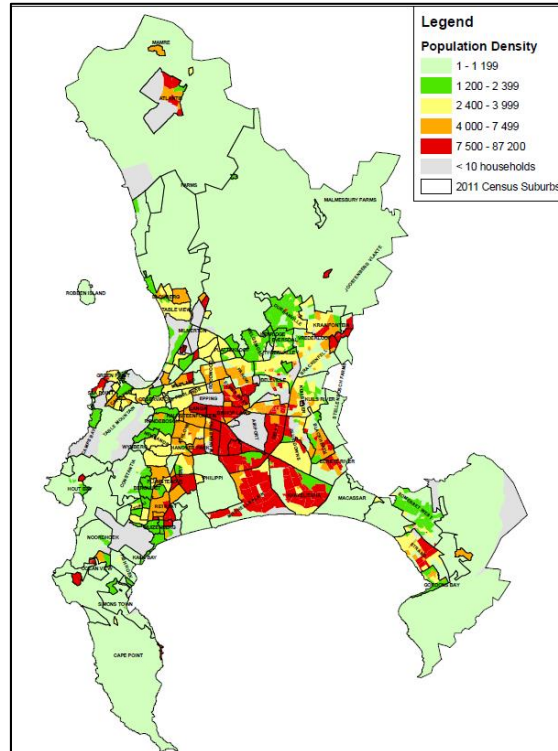
Source: City of Cape Town, 2018b: pp 49

In 2017 Cape Town had a gross population density of 1700 people per km².⁷⁹ Lower income areas with larger household sizes display higher densities than wealthier areas, except where the affluent areas are characterised by high-rise apartment buildings. In Cape Town, densities in the poorer metro south-east are the highest (figure 23).

⁷⁸ City of Cape Town, 2018b

⁷⁹ City of Cape Town, 2018g

Figure 23: Cape Town Gross Population Density per km², 2011



Source: City of Cape Town, 2013. Strategic Information: Strategic Development Information & GIS Department using Census 2011 data from Statistics South Africa

A focus on transit-oriented growth and development is a key focus of the City's MSDP (2018). In terms of the MSDP, the City will in future manage urban growth and development in accordance with the following four primary areas:

- an Urban Inner Core where public investment is prioritised, and where private sector investment is incentivised;
- Incremental growth and consolidation areas where the City will keep servicing existing developments and maintaining existing infrastructure;
- Discouraged growth areas where the City will not make any investments, which may include protected areas where there are natural and agricultural assets;
- Critical natural asset areas that contribute significantly to Cape Town's future resilience and/or are protected by legislation⁸⁰.

Excellence in mainstreaming basic service delivery

A resilient city has reliable and redundant infrastructure networks in place to ensure uninterrupted provision of quality basic services. It is therefore important that a city ensures excellence in mainstreaming basic service delivery to its residents.

Between 2011 and 2016 household access to piped water, sanitation and energy declined slightly in Cape Town (table 1). This decline may be the result of the growth of informal and backyard dwellings (figure 24).

⁸⁰ City of Cape Town, 2018b

Household access to refuse removal has continued to improve between 2011 and 2016 (table 1). This has many positive implications for both household and urban resilience and sustainability, where a cleaner environment for example would lead to improved health.

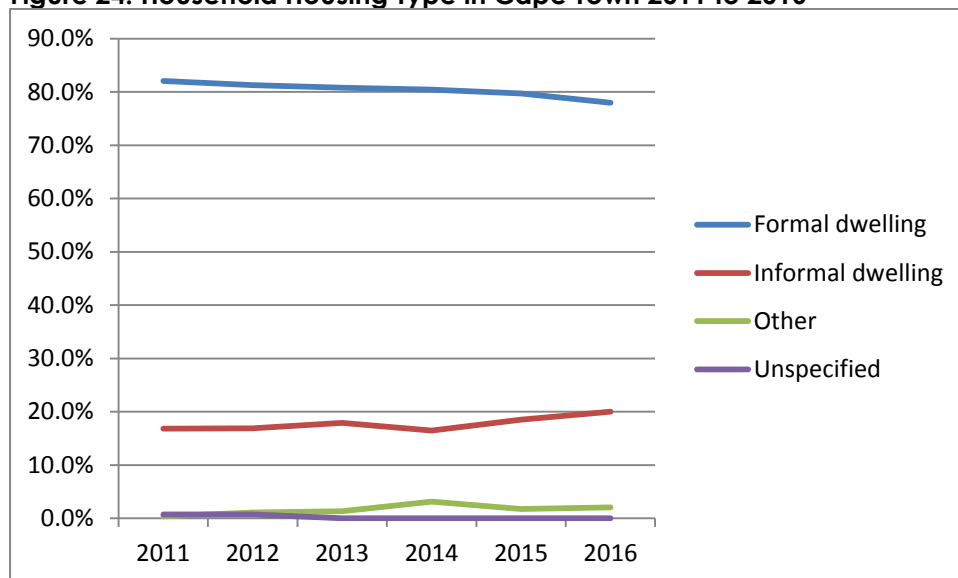
Table 1 Household Access to Basic Services in Cape Town, 2011 to 2016

| Year | Basic Services | | | |
|------|----------------|------------|-----------------|---------------|
| | Water | Sanitation | Refuse disposal | Energy source |
| 2011 | 98.5% | 94.3% | 92.7% | 96.4% |
| 2012 | 97.4% | 94.0% | 93.2% | 95.7% |
| 2013 | 96.4% | 93.6% | 91.3% | 97.8% |
| 2014 | 98.7% | 93.6% | 92.3% | 98.3% |
| 2015 | 96.2% | 91.8% | 94.7% | 96.7% |
| 2016 | 95.6% | 92.3% | 96.4% | 91.8% |

Source: Statistics South Africa, General Household Survey 2011 to 2016

As is characteristic of many developing cities, service levels differ between formal and informal areas in Cape Town. Households living in informal dwellings⁸¹ increased from 16.8% to 20% between 2011 and 2016 (figure 24).

Figure 24: Household Housing Type in Cape Town 2011 to 2016



Source: Statistics South Africa, General Household Survey 2016

The formal, state-subsidized housing delivery system for poorer households is characterised by mainly large-scale developments of, free-standing units predominantly located on the city edge. The City recognises that more social housing is needed on better located land. The City is also prioritising the provision of inclusionary housing through in-fill development that will help deliver a more compact city form. Certain townships (e.g. Joe Slovo Park in Milnerton) are already strategically well-located relative to job opportunities and further have benefitted

⁸¹ Informal dwellings include informal dwellings in settlements, informal dwellings in backyards and traditional dwellings.

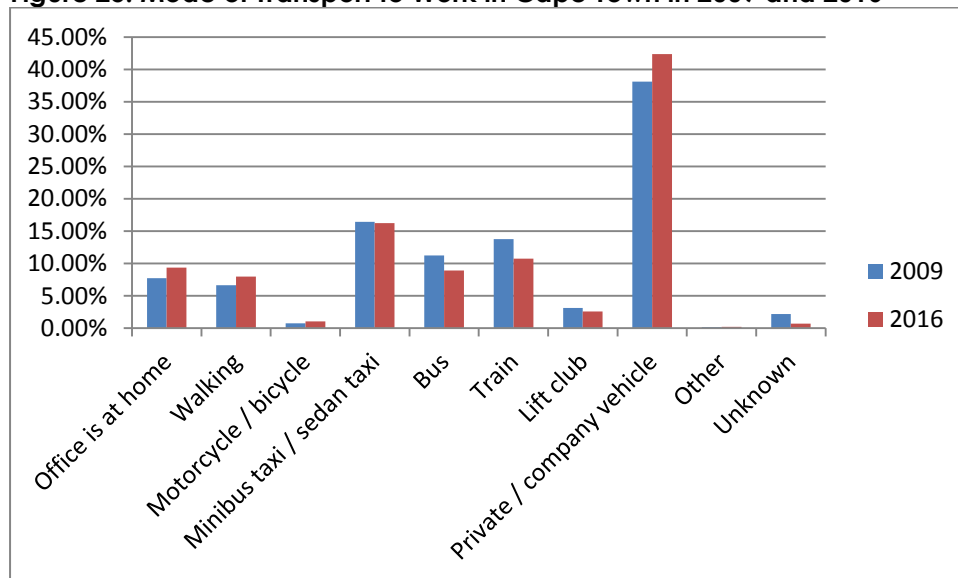
from the MyCiti bus service roll-out and are consequently witnessing an increase in density particularly through backyard dwellings⁸².

The affordable private rental housing market⁸³ is another important, but often ignored, market for ensuring that the poor to low-middle income population are able to access housing. In 2011, small-scale private rental housing accounted for 35% of all rentals or 10% of all South African households⁸⁴.

An efficient, integrated transport system

A well-functioning mass urban public transport system is critical to facilitate improved mobility between places of work and home. In the Cape Town context, it is essential that the Metrorail system functions optimally for transport oriented development (TOD) to be successful.

Figure 25: Mode of Transport to Work in Cape Town in 2009 and 2016



Source: Statistics South Africa, General Household Survey 2016

Comparing 2009 and 2016 data (figure 25), there is a clear increase in private and/or company car usage for travel to work in Cape Town. This trend is matched by a decrease in the use of public transport (minibus taxi, bus and train) and lift clubs (figure 25). The majority of low and low-middle income groups use public transport daily, whereas the majority of high-middle and high income groups never use public transport⁸⁵. There are various reasons for declining commuter preferences towards public transport, ranging from increased car ownership to poor performing public transport infrastructure, particularly that of rail. Rail and minibus taxis were rated poorly in Cape Town for the following characteristics: comfort, security, safety, reliability, appearance, accessibility and convenience⁸⁶.

⁸² City of Cape Town, 2018a

⁸³ These are non-state-subsidized rental properties that cater to households earning between R3 500 to R15 000 per month. The market includes rentals priced from R700 to R3000 per month (Development Action Group, 2018).

⁸⁴ Development Action Group, 2018

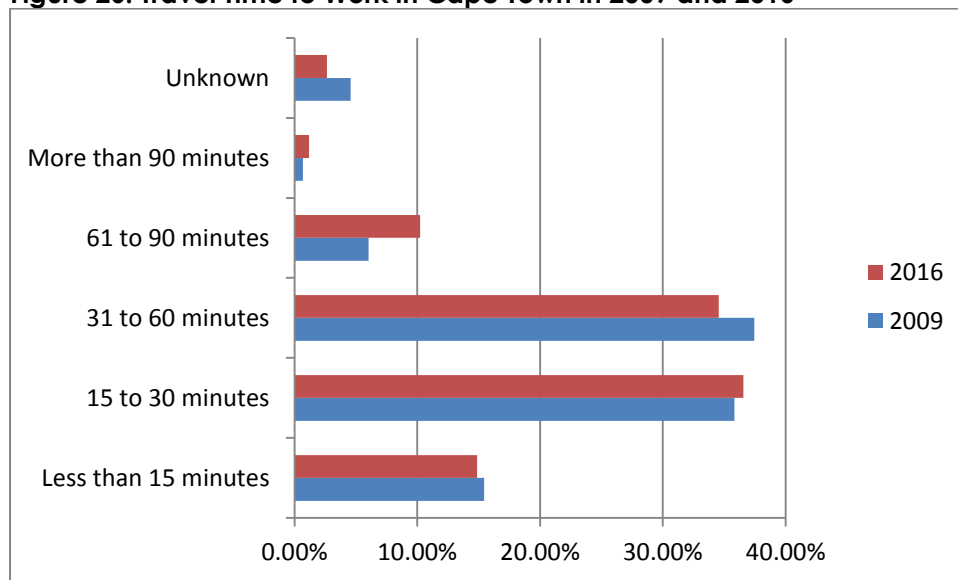
⁸⁵ Nel & van der Merwe, 2014

⁸⁶ Ibid

The unreliability of the Metro rail service negatively impacts on the economy and on traffic congestion. Commuters are forced to switch to more expensive alternatives such as bus, taxi or private cars. This adds to their transport costs and increases road traffic congestion⁸⁷.

More cars on the road has resulted in more commuters travelling for longer periods to work – evident in the increase of commuters requiring 61 to 90 minutes or more travelling to work between 2009 and 2016 (figure 26). With a congestion level⁸⁸ of 35% in 2017⁸⁹ Cape Town was ranked among the most congested cities – and according to the TomTom Traffic Index, 48th out of 390 cities globally⁹⁰.

Figure 26: Travel Time to Work in Cape Town in 2009 and 2016*



*Excludes those working from home

Source: Statistics South Africa, General Household Survey 2016

There has been an increase in people walking to work, using motorcycle or bicycle and those working from home. This may partially be a result of the start of the implementation of spatial plans which aim at bringing people closer to work or where people choose to live (i.e. closer to work) as well as a reflection of the impact of millennials entering into the economy. This shift is also evident in that between 2009 (35.83%) and 2016 (36.56%) there was an increase in commuters taking 15 to 30 minutes to get to work (figure 26). The increased incidence of people working from home is made more possible and efficient with advancements in technology and increased internet connectivity and accessibility.

Internet Connectivity

Millennials refers to the generation born between 1980 and 2000. As the millennials reach their prime working and spending years, their impact on the economy is going to be significant. Millennials have come of age during a time of rapid and digital technological change, globalisation and economic disruption. This has provided

⁸⁷ Herron, 2017

⁸⁸ Increase in overall travel times when compared to a free flow situation (an uncongested situation) (TomTom Traffic Index).

⁸⁹ This was an increase by 5% from the previous year.

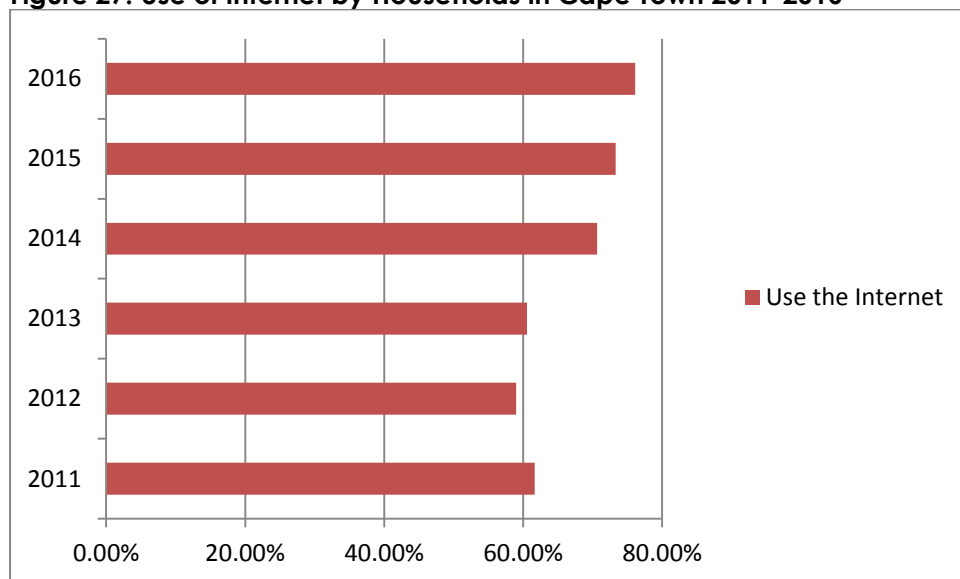
⁹⁰ In comparison, Johannesburg was ranked 70th for the same year.

them with unique behaviours and experiences. Impacted by technology-enabled services that allow access rather than ownership, they promote what is termed a “sharing economy”, with less interest in owning cars or their own homes, for example. They are the first generation of digital natives, and their affinity for technology helps shape how they shop. They are used to instant access to price comparisons, product information and peer review⁹¹.

In 2017 a global study short-listed 100 cities, including Cape Town, from thousands of cities as millennial dream destinations. Cape Town ranked 77th overall, better than many major developed country cities such as Beijing, Sydney, Brisbane, and Boston. One of the essentials for millennials, both socially and for work, is the speed of internet connectivity ranking in a city⁹². Millennials are heavily dependent on the internet for constantly staying socially connected with friends and family via social media.

New ways of working, as illustrated by the *gig economy*⁹³, place greater dependence on technology-enabled applications (apps) and the required internet access that goes with it. Cape Town's economy is shifting towards a high-skill, high-technology intensive growth path (see Economy section) where the role of high quality internet connectivity is important.

Figure 27: Use of Internet by Households in Cape Town 2011-2016



Source: Statistics South Africa, General Household Survey 2011 to 2016

⁹¹ Goldman Sachs, 2018

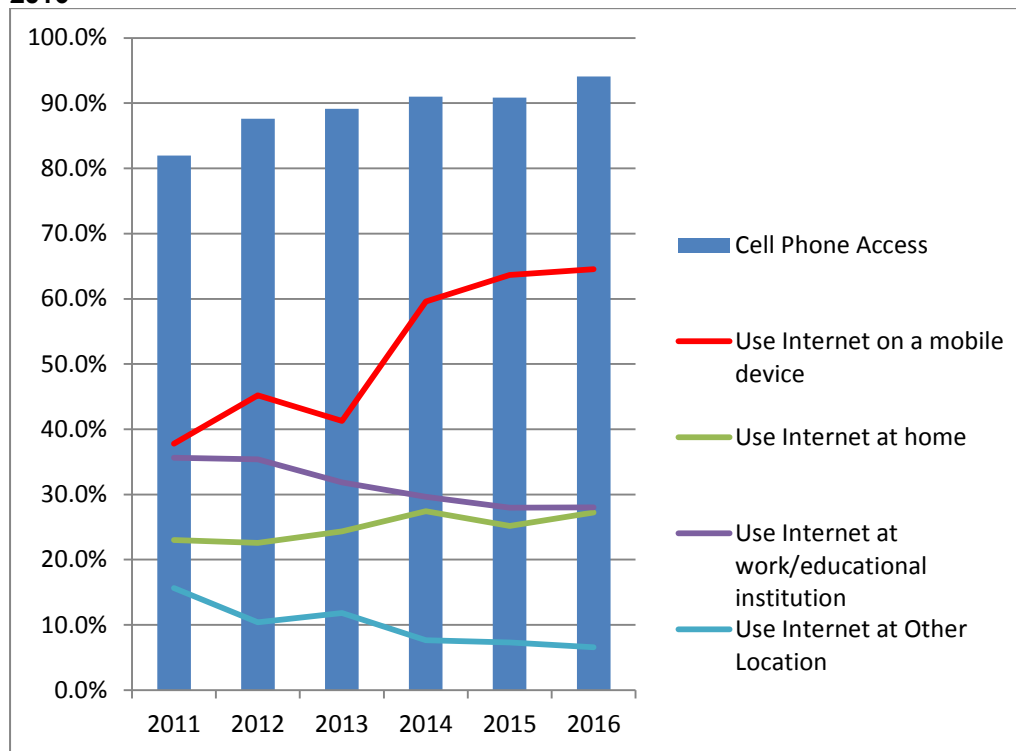
⁹² Nestpick, 2017.

⁹³ The gig economy is made up of three main components: the independent workers paid by the gig (*i.e.*, a task or a project) as opposed to those workers who receive a salary or hourly wage; the consumers who need a specific service, for example, a ride to their next destination, or a particular item delivered; and the companies that connect the worker to the consumer in a direct manner, including app-based technology platforms. Companies such as Uber, Airbnb, Lyft, Etsy or TaskRabbit act as the medium through which the worker is connected to – and ultimately paid by – the consumer. These companies make it easier for workers to find a quick, temporary job (*i.e.*, a gig), which can include any kind of work, from a musical performance to fixing a leaking tap. One of the main differences between a gig and traditional work arrangements, however, is that a gig is a temporary work engagement, and the worker is paid only for that specific job (Istrate and Harris, 2017).

The CCT has fully recognised the role of ICT and has included prioritising the transformation of Cape Town into the most digital city in Africa through investment in digital infrastructure, growing the digital economy, emphasising digital inclusion and enhancing the City's digital governance capabilities, as well as to ensure that Cape Town becomes the preferred destination for technology start-ups in the country⁹⁴.

The CCT had by June 2018 installed 968.9 km of broadband fibre optic cables, to connect the City's buildings (including libraries and service points, as well as bus stations, cameras and other infrastructure vital for service delivery – and has assisted by making more public access points available. Combined with the private sector's public network coverage, Cape Town is a well-connected city. This is further evident in that between 2011 and 2016 there was a steady increase from 61% to 76% in internet usage by Cape Town's households (figure 27). Increasingly, over the same period, the majority of Cape Town households primarily accessed the internet via mobile phones (figure 28) –corresponding to an increase in mobile phone access – which typically is more expensive⁹⁵.

Figure 28: Accessing the Internet and Cell Phone Access by Cape Town Households, 2011 - 2016



Source: Statistics South Africa, General Household Survey 2011 to 2016

⁹⁴ City of Cape, 2017b: Objective 1.2: Leveraging Technology for Progress

⁹⁵ Ngo, D. 2016. 'Home networking explained, part 4: Wi-Fi vs internet', 3 September 2016. <https://www.cnet.com/how-to/home-networking-explained-part-4-wi-fi-vs-internet/>. Data costs in South Africa is particularly expensive and have led to various social campaigns around reducing data (e.g. twitters #DataMustFall). The Independent Communications of Authority of South Africa (ICASA) has also considered reducing data costs (see <http://ewn.co.za/2018/05/17/data-must-fall-says-telecommunications-minister>).

Key Message

Cape Town's built environment is transitioning towards a resilient and sustainable urban form that meets the needs of a rapidly changing urban landscape and population as the city continues to grow. The revised spatial development framework for Cape Town seeks to ensure that the urban poor are able to access better located housing, as well as to create better connectivity between the informal and the formal city, by breaking the apartheid planning legacy through TOD. An efficient, integrated transport system aims to ensure that those in the periphery of the city are well connected to places of economic opportunity and services.

Cape Town has improved access to connectivity and the internet to support economic and social development, with a strong platform for future growth as a smart city. Challenges around informality remain given the high demand for housing and services. There is need for diverse modalities for delivering housing opportunities in the context of limited resources for delivering public/low-cost housing.

Conclusion

From an *economic* perspective there is sufficient evidence to suggest that Cape Town has, to some degree, a resilient economy. Cape Town for example has witnessed the 1 in 100 year flood three times between 2004 and 2013⁹⁶ and from 2016 onwards to 2018 and continuing is experiencing the worst drought in 150 years, yet the Cape Town economy continued to function efficiently with the city's real GDP growth on par with national growth. The adaptive measures implemented by industry as well as the City to mitigate against the impacts of the current drought signals a resilient economy. However the negative impact of the drought –and future extreme weather events –on business should not be overlooked.

Cape Town's economy is moving towards sustainability, with evidence emerging of a decoupling of economic growth from resource use such as for example, electricity consumption. This means there is slightly less environmental degradation associated with Cape Town's economic growth.

There are however economic alerts that need to be addressed in order to improve Cape Town's economic resilience. The impact of information and communication technologies and the 'fourth industrial revolution' has influenced the shift in Cape Town's economy to a high-skill, high-technology intensive growth path. This has reinforced the mismatch between Cape Town's low-skilled labour force and the industry skills requirements.

Additionally, although employment in Cape Town continues to rise, there remains concern of an increasing number of long-term unemployed people in the city and the potential negative effects on social cohesion, which may deepen existing social challenges (i.e. crime and substance abuse).

From a *societal* perspective it is often challenging to measure how resilient a society is due to data challenges. Health statistics nonetheless indicate an overall improvement in the health status of Cape Town residents, reflected by the increase in average life expectancy at birth. The high levels of literacy in Cape Town provide a strong acknowledgement of the role of education and life skills, with it providing a strong basis for individuals and households to better manage conflict and stressors in their lives, and thus building greater personal, family, household and/or community resilience.

Whilst poverty in Cape Town remains widespread, encouragingly there has been a gradual decline in poverty amongst the Black African population group between 2012 and 2017. The number of indigent households on the City's list of indigent households has also declined between 2012 to 2017 – this may also be attributed to an increase in number of households that are recipients of social grants over the same period.

The high negative impact of violence and crime on household and community resilience as well as on social cohesion cannot be overstated. The need for social accords focusing on social cohesion in high-risk communities should be prioritised.

⁹⁶ See City of Cape Town, 2014: 134

From an *environmental* perspective Cape Town continues to pride itself on its natural heritage –which is also a huge tourist attraction to the city –and as such has a number of intensive environmental management programmes to ensure environmental sustainability. Many of these environmental management initiatives are greatly dependent on the lifestyle and practices of Cape Town's residents and industry. The importance of the Circular Economy (particularly in the context of waste management) and Green Economy cannot be more emphasized. Similarly the significance of implementation of green infrastructure –particularly water sensitive urban design and alternative water sources is imperative.

From a *Built Environment* perspective Cape Town is prioritising sustainable urban form through its revised Municipal Spatial Development Framework which emphasises TOD and densification. However, the challenge of informality and housing persists. It is recognised that diverse modalities for housing opportunities is required.

Cape Town proves itself to be a digitally connected city where it ranks as one of the top global city destinations for the millennials to work and live. The millennials will be an important driving force for sustaining city economies. Additionally Cape Town prides itself with excellence in basic service delivery to its residents.

To ensure that TOD is successful it is important that a well-functioning mass public transport exists. In this respect it becomes critical that the passenger rail services improve its reliability and safety.

For Cape Town to further become a resilient city it is critical to embed resilience principles, and thinking into all policy making, planning and implementation. The City of Cape Town is being proactive and leading from this perspective as it is currently formulating a City Resilience Strategy which will have cross-cutting implications in all key urban sectors. Additionally key city strategic documents (e.g. IDP 2017-2022; Municipal Spatial Development Framework, 2018; and CCT Environmental Strategy, 2017) have already adopted resilience thinking quite explicitly providing a good indicator that the City is investing significantly in ensuring Cape Town becomes a resilient city.

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